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THE

AMERICAN ORCHARDIST:

OR

A PRACTICAL TREATISE ON THE CULTURE AND MANAGEMENT OF

APPLE AND OTHER FRUIT TREES,

WITH

OBSERVATIONS ON THE DISEASES TO WHICH THEY ARE LIABLE, AND THEIR REMEDIES.

TO WHICH IS ADDED

THE MOST APPROVED METHOD

OF

MANUFACTURING AND PRESERVING CIDER.

COMPILED

FROM THE LATEST AND MOST APPROVED AUTHORITIES, AND ADAPTED TO THE USE OF AMERICAN FARMERS.

BY JAMES THACHER, M. D.
Fellow of the American Academy of Arts and Sciences, and of the Massachusetts Medical Society, &c. &c.

"Nature, in her teaching, speaks in very intelligible language, and that language is conveyed by experience and observation."

BOSTON:
PRINTED AND PUBLISHED BY JOSEPH W. INGRAHAM.
1822.

57,225
Dec. 11, 1961

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DISTRICT OF MASSACHUSETTS, TO WIT:

DISTRICT CLERK'S OFFICE.

BE it remembered, That on the third day of January, A. D. 1822, and in the forty-sixth year of the Independence of the United States of America, Joseph W. Ingraham, of the said district, has deposited in this office the title of a book, the right whereof he claims as proprietor, in the words following, to wit:

" The American Orchardist; or a practical treatise on the culture and management of apple and other fruit trees, with observations on the diseases to which they are liable, and their remedies. To which is added the most approved method of manufacturing and preserving cider. Compiled from the latest and most approved authorities, and adapted to the use of American farmers. By James Thacher, M. D. Fellow of the American Academy of Arts and Sciences, and of the Massachusetts Medical Society, &c. &c. 'Nature in her teaching, speaks in very intelligible language, and that language is conveyed by experience and observation.' "

In conformity to the act of the Congress of the United States, entitled, "An act for the encouragement of learning, by securing the copies of Maps, Charts, and Books, to the authors and proprietors of such copies, during the times therein mentioned;" and also to an act, entitled " An act supplementary to an act, entitled, An act for the encouragement of learning, by securing the copies of Maps, Charts, and Books, to the authors and proprietors of such copies during the times therein mentioned; and extending the benefits thereof to the arts of Designing, Engraving, and Etching, Historical, and other Prints."

JNO. W. DAVIS,
Clerk of the District of Massachusetts.

TO THE

PRESIDENT AND OTHER OFFICERS OF THE MASSACHUSETTS AGRICULTURAL SOCIETY.

GENTLEMEN,

PRESUMING upon your acquiescence, I introduce to your notice this little practical treatise upon one of the most interesting and pleasing branches pertaining to the science of agriculture. The utility of a cheap publication of this kind, for the information and encouragement of our farmers, is unquestionable. If this humble attempt should meet your approbation, and be found to possess a degree of merit calculated to co-operate with your zealous efforts to promote agricultural pursuits and improvements in our country, a knowledge of your character is an ample pledge that you will not withhold your patronage and favour. If, however, it shall appear that I have subjected myself to the accusation of having stepped beyond the limits, within which my actual knowledge should be confined, then will a consciousness of laudable motives, of assiduity and fidelity in the collection of experimental facts, remain as my only consolation. I am not unapprized of the almost invincible prejudice, which prevails among our farmers, against what they term "book-farming," "book-knowledge," &c. &c.; and the anecdote is fresh in my memory, of an honest farmer, who, on being inquired of Why his neighbour's farm was not more productive, replied, " because he has *booked* it to death." These prejudices exist chiefly among those, whose minds are unenlightened, and views unexpanded by that useful knowledge, which is only to be acquired by reading. It must be conceded that almost all improvements are derived from the records of practice and observation; and when we have reason and experience to support, and plain facts to confirm, we may become less tenacious of the rules of our fathers, believing that it may be the reserved privilege of the children, to acquire the skill of producing two spires of grass where their fathers produced but one. It is a remarkable fact that the first planters bequeathed to their posterity a greater number of orchards, in proportion to their population, than are now to be found in the old colony; and it is no less notorious that the children have substituted a poisonous liquor for the salutary beverage, which almost exclusively cheered the hearts of their virtuous ancestors. The views of men are often materially affected through mere indolence of temper, no less than through the cloud of prejudice. Averse to the labour of reading and inquiry, they adhere pertinaciously to the routine of their predecessors, and treat with equal contempt the lessons of experience, and all suggestions of improvement. It is not, however, desirable that former modes of practice in husbandry should be abandoned until it shall be incontestably proved, that a system more adapted to our circumstances, and in all respects of superiour utility, can be founded on the surest basis. It is not to be required of our farmers to subject themselves to the expense and uncertainty of novel experiments; but he who possesses capital and leisure, and who, in the spirit of investigation, shall put in execution a hundred new projects, although in ten only shall he be successful in the acquisition of useful knowledge, will be entitled to publick praise and respect. These pages contain no speculative or visionary projects, nor recommend any untried experiments. Although a portion of information is derived from European authors, no inconsiderable part of it has been collected from the practical experiments and observations of our own countrymen. There is, therefore, no part of this production but what may be adopted as applicable to our climate, and calculated to promote the interests of the cultivators of our soil. The knowledge respecting the proper management of fruit trees is contained in numerous volumes, and in incidental papers, published in periodical works. My object has been to collate and embrace all the principal circumstances relative to the subject, and condense the whole into a small compass, that shall be accessible both to the pecuniary means of all, and to the intellectual powers of the most ordinary capacity. The authorities to which I am chiefly indebted, are the several encyclopedias, Forsyth on Fruit Trees, and the valuable periodical publications of your society, and various other similar productions. If, in a few instances, it shall appear that I have employed borrowed language without marks of quotation, my apology is, that I have copied from minutes collected at various times, without reference to the source whence derived; not that I would wittingly pilfer the cultivated fruit of others, and impose it upon my guests as the result of my own industry.

Nothing can be more irksome to a reflecting mind than a state of inactivity and idleness. I have devoted some of my leisure hours to the subject of this treatise, and have derived from the employment both recreation and improvement. Should the book share the fate of many others, and pass into neglect and oblivion, it will not be a cause of chagrin; but if it should be so fortunate as to rise into popularity, and arrest the attention of our farmers, who may be assured that a little "book-knowledge" will do them no harm, it will be a source of the highest gratification.

The Massachusetts Agricultural Society, through your agency, gentlemen, has already exerted a happy influence, tending to eradicate former prejudices, and greatly to ameliorate the condition of our husbandry in its various branches.

With the view of encouraging a familiarity with agricultural books among our farmers, permit me to suggest the expediency of supplying our several county societies with the Massachusetts Agricultural Repository, on the most favourable terms for distribution; and also of paying, in certain proportions, your annual premiums in cheap books on agricultural subjects.

That you may long continue to enjoy the satisfaction to be derived from your patriotick labours, is the fervent desire of

Your humble and obedient servant,
JAMES THACHER.

PLYMOUTH, July, 1821.

RECOMMENDATION.

THE gentlemen who sign the following Recommendation are officers of the Massachusetts Agricultural Society, although they do not subscribe as such; but cheerfully consent, as individuals, to honour the publication with the following testimony of their approbation.

Boston, September 10, 1821.

WE have perused, at the request of Dr. Thacher, his Treatise on the Culture of Fruit Trees, and the Art of Making Cider; and, although we cannot hope that our opinions will have any great weight with the publick, yet, as the author is desirous that we should express them, we have no hesitation in saying, that it appears to us an excellent compendium of all that has been written on the subject—comprising, within a moderate compass, the result of the observations of the experienced cultivators of Europe, and of this country—with many original suggestions of his own—and we believe that such a work will be of great value to those, who wish to obtain a knowledge of this branch of agriculture, but who cannot have access to the original sources, from which, with great labour, and, as we believe, good judgment, this compilation has been formed.

[Names of the gentlemen who, as individuals, sign the above recommendation; with the addition of their titles, as copied from the Massachusetts Agricultural Journal.]

AARON DEXTER, M. D., President.
SAMUEL W. POMEROY, Esq., First Vice-President.
THOMAS L. WINTHROP, Esq., Second Vice-President.
JOHN PRINCE, Esq., Treasurer.
JOHN LOWELL, Esq., Corresponding Secretary.
Hon. RICHARD SULLIVAN, Recording Secretary.
Hon. PETER C. BROOKS,
Hon. JOHN WELLES,
Hon. JOSIAH QUINCY,
S. G. PERKINS, Esq., } Trustees.
GORHAM PARSONS, Esq.,
E. HERSEY DERBY, Esq.,

THE following valuable remarks by two of the gentlemen whose names are subjoined to the preceding recommendation, were not received till after the printing of the volume was completed.

"I REGRET that I had not seen the MS. as I should have taken the liberty of recommending to the notice of Dr. Thacher, the best of all the cherries—the Black Tartarian, introduced by Prince Potemkin, from Pontus to St. Petersburgh, soon after the conquest of the Crimea, and brought to London by a British botanist, in 1796; from whence my friend, the late Eben. Preble, Esq. imported a tree some years after, at five times the price of common sorts, which he planted in his garden in Boston, but removing it the second year, to make room for a building, checked the bearing, and I was enabled by a cutting he had previously given me, to produce the first dessert of this noble fruit, in the United States. It is a constant, full bearer; succeeds better by grafting than any other sorts; is of larger size than any; and may be said to be in eating from the time it is two thirds grown, till some time after fully ripe; and as evidence of superiour excellence, has generally brought double the price of the best black hearts in the Boston market." S. W. POMEROY.

"PERMIT me to suggest that so far as my experience goes, I have found the first week of September the best time for budding young peach stocks. The bud is not so subject to gum at this as an earlier season. [See page 40.]

"While upon the subject of decortication of apple trees, [See page 80,] you might, I think, add, that the operation may be performed with equal success on old pear trees. Dr. Holyoke, of Salem, informed me a few years since, that he had made the experiment on an old pear tree in his yard that had ceased bearing, and restored to it its wonted fecundity.

"I have noted your observations on grafting pears on quince stocks, [pages 33 and 180.] I have a number of trees of this description, and some of them quite large and extremely vigorous and healthy. They produce annually in great abundance, and some of the largest and finest pears of their kind which I have ever seen are produced on those trees. But the stock should be from what is called the Portugal quince, which grows as fast as the natural or free stock; and the pears put on them should always be of the soft flesh, or buttery kind; the breaking pears do not answer so well on this, as on the free stock. In France all their finest pears, of the buttery kind, are raised on the Portugal quince stocks." S. G. PERKINS.

ERRATA.

Page 60, line 3 and 4, *for* John Wells, esquire, of Dorchester, *read* honourable John Welles, of Dorchester, one of the trustees of the Massachusetts Agricultural Society.

Page 129, line 15, *for* Pomone d'Apis, *read* Pomme d'Apis.

THE

AMERICAN ORCHARDIST.

APPLE TREES.

Among the numerous varieties of fruit-bearing trees, cultivated in our country, the apple is, confessedly, of superiour importance and utility. Whether considered as an esculent for the dessert, as an article for culinary purposes, or as affording a pleasant and wholesome beverage, this fruit is not to be surpassed in excellence. If the productions of tropical climates are valued for their grateful and delicious qualities, the apple, more permanent and durable, and possessing nutritive and salubrious properties, is incomparably of the greatest estimation. From a natural and happy gradation, this fruit attains to full growth, in successive order, during summer and autumn; and, acquiring greater perfection and maturity after gathering, it may, by proper care, be preserved for the table, or for culinary use, until the return of the flowering season. The soil and climate of the United States are admirably adapted to the growth of the apple tree, except in certain districts in the south, where the land is level and sandy, and the atmosphere replete with humidity. Even the colder regions of Maine annually furnish excellent apples for the Boston market. We have an ample variety of apples, many of which are allowed to be of superiour quality as to size, beauty, and flavour. Notwithstanding, however, these advantages, and the immense value of apple orchards, their cultivation has received but inadequate attention from the farmers of our country. It must be confessed, as a notorious truth, that an orchard, planted and cultivated in the most advantageous manner in point of beauty, profit, and convenience, is scarcely to be found in the sphere of our observation. The most palpable neglect prevails in respect of proper pruning, cleaning, and manuring round the roots of trees, and of perpetuating choice fruit, by engrafting from it on other stocks. Old orchards are, in general, in a state of rapid decay; and it is not uncommon to see valuable and thrifty trees exposed to the depredations of cattle and sheep, and their foliage annoyed by caterpillars and other destructive insects. In fact, we know of no branch of agriculture so unaccountably and so culpably disregarded. If it be objected, that the profit will not remunerate for the labour and expense of cultivation, the obvious reply is, let the experiment be fairly tried, in a few instances, and the result will soon correct the erroneous impression, and stimulate to greater attention to the subject. It may, with propriety, be affirmed, that a judiciously-cultivated orchard of select fruit, if situated at a convenient distance from a large town or village, would yield an annual profit equal to any production of the industrious husbandman. An instance has been adduced, in the town of Dorchester, a few years since, of one hundred and sixty barrels of apples being produced from less than two acres, the estimated value of which, including the grass mowed under the trees, is three hundred dollars per acre. In what branch of culture can the husbandman realize a more ample and gratifying reward for his labour and attention?

It is a circumstance encouraging to the cultivator, that, "in addition to the usual markets, a very considerable export has taken place lately to Europe, and that the flavour of our apples is highly estimated there." In every rural establishment, a fruit orchard should be considered an indispensable appendage, as a source of real emolument, and as contributing to health, pleasure, and recreation. It will be conceded, that, in the whole department of rural economy, there is not a more noble, interesting, and beautiful exhibition, than a fruit orchard, sytematically arranged, while clothed with nature's foliage, and decorated with variegated blossoms perfuming the air, or when bending under a load of ripe fruit of many varieties. It is among the excellences of a fruit orchard, that it affords a salubrious *beverage*, an adequate supply of which would have a happy tendency to diminish, if not supersede, the consumption of ardent spirits, so destructive to the health and moral character of our citizens. "The palate," says Mr. Knight, an English horticulturalist, "which relishes fruit, is seldom pleased with strong fermented liquors; and, as feeble causes, continually acting, ultimately produce extensive effects, the supplying the publick with fruit, at a cheap rate, would have a tendency to operate favourably, both on the physical and moral health of the people." It is presumable, that the period is not far distant, when the subject of horticulture will receive its merited attention, and the value and utility of fruit orchards be duly appreciated by all ranks of our citizens; and it will be to me a source of pride and satisfaction, should these pages contribute, in any degree, to the promotion of the desirable object. The most eligible and approved method of propagating fruit trees, some account of the numerous insects which infest and prey upon their vitals, with the various diseases to which they are liable, and which prove fatal to their existence, and the best adapted remedies, will constitute the principal topicks of this undertaking. While philosophers pride themselves upon vain speculation, the practical farmer will be contented with plain facts, from whatever source derived. Leaving to others, therefore, the task of wandering in the perplexing mazes of theory, suffice it here to excite, in the orchardist and farmer, the spirit of practical activity, and to stimulate by the lessons of attentive and intelligent men; for "nature, in her teaching, speaks in very intelligible language, and that language is conveyed by experience and observation." No apology will be urged for any inelegance of style, as perspicuity and brevity are conceived to be more acceptable requisites, in the view of the respectable cultivators of our soil, for whose use this little work is intended.

PHYSICAL PROPERTIES OF APPLES.

"In diseases of the breast, says Dr. Willich (Dom. Ency.) such as catarrhs, coughs, consumptions, &c. they are of considerable service. For these beneficial purposes, however, they ought not to be eaten raw, but either roasted, stewed, or boiled. They may also be usefully employed in decoctions, which, if drank plentifully, tend to abate febrile heat, as well as to relieve painful strictures in pectoral complaints. With regard to their sensible properties, apples have been divided into spicy, acidulated, and watery. To the first class belong the various species of rennet, which possess a most delicate flavour, contain the least proportion of water, and, on account of their vinous nature, are not apt to excite flatulency. Pippins, on the contrary, though affording more nutriment than the former, are more fibrous, and, consequently, require a more vigorous stomach to digest them; hence they should be ranked under the second class. Lastly, those sweet and tender apples which are very juicy and palatable, are the least fit to be eaten in a raw state, unless with the addition of bread or biscuit. When baked, or dried in the open air, they make an excellent substitute for raisins or plums, in puddings, pies, and other dishes prepared of flour. Sour apples may be much improved, both in taste and quality, by either baking or digesting them in a close vessel, by steam, over a slow fire. Thus the saccharine principle is disengaged, and they undergo a speedy and complete change." The honourable T. Pickering, in his address to the agricultural society, Essex county, expresses himself in the following language: "After providing a due proportion of apples for the table and the ordinary purposes of cookery, I do not hesitate to express my opinion, that, for all other uses, sweet apples are entitled to the preference. The best cider I ever tasted, in this country, was made wholly of sweet apples. They afford also a nourishing food to man and all domestick animals. What furnishes a more delicious repast than a rich sweet apple baked and eaten in milk? I recollect the observation made to me by an observing farmer, before the American revolution, that nothing would fatten cattle faster than sweet apples. Mentioning this, a few years since, to a gentleman of my acquaintance in an adjoining state, he informed me, that he was once advised to give sweet apples, to a sick horse. Happening then to have them in plenty, the horse was served with them, and he soon got well, and, continuing to be fed with them, he fattened faster than any other horse that he had ever owned that was fed with any other food. Mentioning to the same gentleman, what I had long before heard, that a good molasses might be made of sweet apples, he confirmed the fact by an instance within his own knowledge, &c. &c. The process is very simple. The apples being ground, and the juice expressed at the cider mills, it is immediately boiled; and the scum being taken off, the boiling is continued, until the liquor acquires the consistence of molasses."

Mr. Knight, an English gentleman, in his treatise on the apple and pear, says that the juice of these fruits might be used with great advantage on long voyages. He has frequently reduced it by boiling to the consistence of a weak jelly, and in this state it has remained several years without the slightest apparent change, though it has been intentionally exposed to much variation of temperature. A large quantity of the inspissated juice would occupy but a very small space; and the addition of a few pounds of it to a hogshead of water would probably at any time form a good liquor similar to cider or perry. It might also, he thinks, be used to supply the place of rob of lemons and oranges, and might be obtained at a much lower price.

I avail myself of the following appropriate sentence, in the language of one who has long been eminently distinguished for his numerous patriotick and amiable virtues.*

"When we consider the various manners in which fruits are beneficial; when we recollect the pleasure they afford to the senses, and the chaste and innocent occupation which they give in their cultivation; when we consider the reputation which they communicate to a country in the eye of strangers, especially as affording a test of its climate and industry; when we remember the importance of improving the beverage which they are intended to supply; when it is calculated under how many solid forms they may be exported (as dried, baked, and preserved, as well as in their natural state;) and lastly, when we reflect upon the utility of giving to our rural labours a thoughtful turn, which is the best substitute now left, after having quitted our primeval state; I say, when we consider these things, it will appear that the subject of fruits, which were the first earthly gift of Providence to man in his more favoured state, may well continue to merit both the publick and individual attention."

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* See a letter on fruit trees, by a member of the Kennebeck agricultural society, published in papers on agriculture. Mass. society, 1804.

ORIGINAL STOCK.

It is the opinion of botanists, "that the wilding, or *crab-apple* of the woods and hedges, is the original kind from the seeds of which the apple now cultivated was first obtained. The varieties of this species are multiplied to some hundreds, in different places, all having been first accidentally procured from the seed or kernels of the fruit, and then increased by grafting upon *crabs* or other kinds of apple stocks." (Dom. Ency.) The crab is still considered as a proper stock to receive the grafts of the more valuable varieties, and is even preferred by some cultivators as being more hardy, better able to endure cold and coarse land; and they also take firmer root, are of more rapid growth, and make larger trees.

This tree may be found in forests, and other uncultivated places. Its stems and branches are armed with sharp thorns, and its fruit is small, and so extremely acrid and unpleasant, that it is not edible in its natural state. The following description, by Mr. William Bartram, is copied from Mease's edition of the domestick encyclopedia. "The *pyrus coronaria, or native crab apple of North America*, is not eaten, except when preserved in sugar, and in this state, they are deservedly esteemed as a great delicacy. The fruit is flattish, above one inch in diameter, yellow when ripe, or of the colour of polished brass, and possesses an agreeable fragrancy. Perhaps no tree presents a more gay appearance in the spring, when dressed in green, and with clusters of flowers of a most pleasing blush. The petals may be compared to flakes of white wax, faintly tinged with the finest carmine; though some trees have flowers of a damask rose colour." The honourable Timothy Pickering, from long experience, observes, "to bring an orchard as early as possible into profit, plant common wild trees, or what are commonly called crab apples, four or five years old. They should be cut down as soon as planted, and on their young shoots graft or inoculate such fruit as is desired. From this practice, more fruit will be obtained in ten years, than in the usual way in twenty years. The wild tree, if grafted on its own stock, will come much earlier to bearing fruit, and it will be improved both in size and flavour."

CULTIVATED OR SEEDLING-STOCKS.

When the crab stock cannot be procured in sufficient quantity for the purpose of propagation, it becomes necessary to resort to the expedient of culture from the seeds. Seedling stocks, which have a natural tendency to attain the full height of the species to be grafted on them, are generally denominated *free stocks.* Every planter who is solicitous to keep an orchard well stocked with fruit trees, should cultivate in a nursery his own free stocks, and graft for himself, that he may realize all the advantages to be derived from a knowledge of the soil and the peculiar properties of his trees, and thereby avoid many impositions practised by ignorant and artful nursery-men. He will moreover be enabled to select such stocks for grafting, as experience shows to be best adapted to the soil and climate of his plantation, and which meet his own particular views. Trees raised from seed rarely produce the same *species* of fruit with that from which the kernels were taken, yet they are well adapted as stocks for grafting, and it occasionally happens that a new and valuable variety is thus produced, either for cider, or for the dessert. An accurate observer, Mr. Joseph Cooper, of New Jersey, asserts, (Dom. Ency. Mease's edit.) that experience, for more than fifty years, has convinced him, that, although seedlings from apples will scarcely ever produce fruit exactly similar to the original, yet many of them will produce excellent fruit: some will even be superiour to the apples from which the seeds are taken. This fact has led him to plant seeds from the largest and best kinds of fruit, and from trees of a strong and rapid growth, and let all the young trees bear fruit before grafting, which produce uncommon strong shoots or a large rich-looking leaf. He has seldom known them fail of bearing fruit having some good quality; at all events they make a stock to receive the grafts of any good kind which may present itself.

BEST ADAPTED SOIL.

The apple tree will thrive and flourish in many different sorts of soil; but a dry friable loam should probably be preferred, as too much moisture is known to be injurious to the roots. Such soil as produces good crops of corn or grass will, in general, afford the requisite and best adapted nutriment to apple or pear trees. The soil should not only be rich, but have a good depth, not less perhaps than two or three feet. It has been remarked as a fact, that, in each particular place, certain kinds of apples have been observed to succeed better than other kinds; and, according to the observations of the honourable Timothy Pickering, many different sorts will flourish on an acre of ground, when the same number of one sort would starve. When, there-

fore, the cultivator has discovered the varieties most congenial to the soil and situation he occupies, it should be his endeavour to encourage them, by multiplying the grafts on his unproductive trees, or by forming new additional trees by grafting on other stocks.

PRODUCTION OF NEW VARIETIES.

The apple tree does not enjoy indefinite longevity. Each species has its periods of infancy, youth, maturity, and decrepit age; and, in process of time, it is totally annihilated; nor is it in the power of art to protract its existence beyond its limited duration. Hence we frequently hear the complaint, that many varieties of apple, formerly held in high estimation, are no longer to be obtained, having entirely *run out*, as it is termed. The seeds of apples, however, contain the germ of an infinite variety of fruit. New varieties, and some of excellent quality, are continually produced from seeds. The famous winter pippin was the spontaneous production from a seed at Newtown, Long Island. But there is no dependence upon obtaining a particular variety by planting the seeds. "A hundred seeds of the golden pippin will all produce fine large-leaved apple trees, bearing fruit of considerable size; but the tastes and colours of the apple from each will be different, and none will be the same in kind with those of the pippin itself. Some will be sweet, some bitter, some sour, some mawkish, some aromatick, some yellow, some green, some red, some streaked." The seeds for planting, should always be selected from the most highly cultivated fruit, and the fairest and ripest specimen of such variety. In some instances, a new and valuable variety may thus be obtained, and the seedlings will afford some indication of their future produce, even before they attain to their bearing state. The larger and thicker the leaves of a seedling, and the more expanded its blossoms, the more it is likely to produce a good variety of fruit. Short-leaved trees should never be selected, for these approach nearer to the original standard; whereas the other qualities indicate the influence of cultivation. Every fruit tree must attain to a certain age before it can bear fruit. An apple tree from the seed, requires to be twelve or fifteen years old before it will produce fruit in perfection; but a method will be hereafter described by which particular branches may be forced to produce blossoms and fruit at an earlier period, and their quality sooner ascertained.

The following are the sentiments of Mr. Knight, an experienced English horticulturalist, (Edin. Ency. Amer. edit. article horticulture.) All the extensions, he observes, by means of grafts and buds, must naturally partake of the qualities of the original. Where the original is old, there must be inherent in the derivatives the tendency to decay incident to old age. It is not to be understood, however, that a graft cannot survive the trunk from which it was taken: this would be deemed absurd. It may indeed be assumed as a fact, that a *variety or kind of fruit*, such as the golden pippin or the ribston, is equivalent only to an *individual.* By careful management the health and life of this individual may be prolonged; and grafts placed on vigorous stocks and nursed in favourable situations, may long survive the parent plant or original ungrafted tree. Still there is a progress to extinction, and the only renewal of an individual, the only true reproduction, is by seed. As the production of new varieties of fruit from the seed, is a subject which now very much occupies the attention of horticulturalists, it may be proper here to state the precautions adopted by Mr. Knight and others in conducting their trials. It is in the first place a rule to take the seeds of the finest kinds of fruit, and from the ripest, largest and best flavoured specimens of that fruit. When Mr. K. wished to procure some of the old apples in a healthy and renovated state, he adopted the following method: He prepared stocks of the best kind of apple that could be propagated by cuttings, and planted them against a south wall in a very rich soil. These were next year grafted with the stire, golden pippin, or some other fine old kind. In the course of the following winter the young trees were dug up, and the roots being retrenched, they were replanted in the same place. By this mode of treatment they were thrown into bearing at two years old. One or two apples were allowed to remain on each tree: these consequently attained a large size, a more perfect maturity. The seeds from these fruits, Mr. K. then sowed, in the hope of procuring seedlings possessed of good or of promising qualities; and these hopes have not been disappointed. In order to produce a hybrid variety, possessing perhaps a union of the good properties of two kinds, Mr. K. had recourse to the nice operation of dusting the pollen of one variety upon the pistils of another. He opened the unexpanded blossom, and cut away, with a pair of fine pointed scissors, all the stamina, taking great care to leave the styles and stigmata uninjured. The fruit which resulted from this artificial impregnation were the most promising of any, and the seeds of these he did not fail to sow. Every seed, though taken from the same individual fruit, furnishes a distinct variety. These varieties, as might be anticipated, prove of very different merits; but to form a general opinion of their value, it is not necessary to wait till they produce fruit: an estimate may be formed, even during the first summer, by the resemblance the leaves bear to those of the highly cultivated or approved trees, or to those of the wild kinds. The more they approach to the former, the better is the prospect. The leaves of good kinds improve in character, becoming thicker, rounder, and more downy every season. The plants whose buds in the annual wood are full and prominent, are usually more productive than those whose buds are small and shrunk into the bark. But their future character, as remarked by Mr. K. must depend very much on the power the blossoms possess of bearing cold; and this power is observed to vary in the different varieties, and can only be ascertained by experience. Those which produce their leaves and blossoms early are preferable, because, although more exposed to injury by frosts, they are less liable to the attacks of caterpillars. It is also to be observed, that even after a seedling tree has begun to produce fruit, the quality of this has a tendency to improve as the tree itself becomes stronger and approaches maturity; so that if a fruit possess any promising qualities at first, great improvement may be expected in succeeding years.

A precaution is suggested, by the honourable T. Pickering, that apple trees, bearing bad or ordinary fruit, should not be suffered to grow with those which bear fruit of a superiour quality. It is a fact, with which gardeners are familiar, that the blossoms of cucumbers will greatly injure the flavour of melons that grow near them; and it is reasonable to suppose that fruits, while forming on the trees, are liable in like manner to suffer deterioration. The result of the following experiment would seem to strengthen the above conjecture. The experiment, it is said, has in numerous instances succeeded, without a single failure. In an orchard, containing a great variety of apple trees, bearing sweet, and some very acrid fruit, and others partaking of both these properties, in the vernal season, when the trees are in full blossom, the pollen (or impregnating dust) was taken from one tree, (for example, where the fruit is very sweet,) and deposited on the flowers of a particular branch of another tree, whose fruit is extremely acrid. The apples of that particular branch were found to combine these two properties for that season; and by this simple process, the experimenter asserts, he can easily provide himself with apples, for that season, perfectly to his taste, which he considers a much more expeditious and equally as certain a process as that of grafting.

An account of a singular apple tree, producing fruit of opposite qualities; a part of the same apple being frequently sour, and the other sweet: in a letter from the reverend Peter Whitney, published in the memoirs of the American academy of arts and sciences, vol. I.

"THERE is now growing, in an orchard lately belonging to my honoured father, the reverend Aaron Whitney, of Petersham, deceased, an apple tree very singular with respect to its fruit. The apples are fair, and when fully ripe, of a yellow colour, but evidently of different tastes—sour and sweet. The part which is sour is not very tart, nor the other very sweet. Two apples, growing side by side on the same limb, will be often of these different tastes; the one all sour, and the other all sweet. And, which is more remarkable, the same apple will frequently be sour one side, end, or part, and the other sweet, and that not in any order or uniformity; nor is there any difference in the appearance of one part from the other. And as to the quantity, some have more of the acid and less of the sweet, and so *vice versa.* Neither are the apples, so different in their tastes, peculiar to any particular branches, but are found promiscuously, on every branch of the tree. The tree stands almost in the midst of a large orchard, in a rich and strong soil, and was transplanted there forty years ago. There is no appearance of the trunk, or any of the branches, having been engrafted or inoculated. It was a number of years, after it had borne fruit, before these different tastes were noticed; but, since they were first discovered, which is about twenty years, there has been, constantly, the same variety in the apples. For the truth of what I have asserted, I can appeal to many persons of distinction, and of nice tastes, who have travelled a great distance to view the tree, and taste the fruit; but to investigate the cause of an effect, so much out of the common course of nature, must, I think, be attended with difficulty. The only solution that I can conceive is, that the *corcula*, or hearts of two seeds, the one from a sour, the other from a sweet apple, might so incorporate in the ground as to produce but one plant; or that farina from blossoms of those opposite qualities, might pass into and impregnate the same seed. If you should think the account I have given you of this singular apple tree will be acceptable to the American academy, please to communicate it.

"I am, &c. PETER WHITNEY."

The above singular phenomenon may now be solved, since it is ascertained that the flowers may be impregnated by the pollen from other trees, and fruit of various qualities is thus obtained. The tree, described by the reverend gentleman, stood "almost in the middle of a large orchard." Will it be deemed an extravagant conjecture, that this tree had acquired a peculiar attachment, or attractive power, by which this curious kind of fecundity was effected?

ENGRAFTED FRUITS NOT PERMANENT.

Mr. Bucknal, an ingenious English writer, has favoured the publick with some highly valuable and interesting observations on the subject of engrafted fruit trees, of which the following is an abstract, from Dom. Ency. Mease's edit. vol. v. p. 192.

Engrafted fruits, Mr. Bucknal asserts, are not permanent. Every one, of the least reflection, must see that there is an essential difference between the power and energy of a seedling plant and the tree which is to be raised from cuttings or elongations. The seedling, is endued with the energies of nature, while the graft, or scion, is nothing more than a regular elongation, carried, perhaps, through the several repeatings of the same variety; whereas the seed, from having been placed in the earth, germinates, and becomes a new plant, whenever nature permits like to produce like in vegetation. Engrafted fruits are doomed by nature to continue for a time, and then gradually decline, till at last the variety is totally lost, and soon forgotten, unless recorded by tradition, or in old publications. From the attention lately paid to the culture of engrafted fruits, we are now enabled to continue a supposed happily acquired tree, for a much longer duration, than if such variety had been left in the state of unassisted nature; perhaps a duration as long again, or something more. But there is no direct permanency, because the kernels, within the fruit, which are the seed of the plants for forming the next generation of trees, will not produce their like. They may do so, accidentally; but nothing more can be depended on. For example, suppose we take ten kernels, or pips, of any apple raised on an engrafted stock: sow them, and they will produce ten different varieties, no two of which will be alike, nor will either of them closely resemble the fruit from which the seeds were collected. The leaves also, of those trees raised from the same primogeneous or parent stock, will not *actually* be a copy of the leaves of any one of the varieties or family, to which each is connected by a vegetable consanguinity. In choosing the seed, that apple is likely to produce the clearest and finest plants, whose kernels are firm, large, and well ripened. The size of the fruit is not to be regarded; for large apples do not always ripen well, or rather, for cider, the small fruits are generally preferred, for making the strongest and highest-flavoured liquor. Should no valuable apples be raised from this process, the seedlings will make excellent stocks to engraft upon. In attempting to acquire new varieties, all the young plants, from the bed of apple quick, whose appearance is in the least degree promising, should be selected and planted together, at such a distance, as to allow each to produce its fruit, which will happen in about from twelve to fifteen or eighteen years, though Mr. Knight had two plants bearing fruit at six, and one at five years. Mr. Bucknal mentions one variety of apple, within his knowledge, which he supposes to be one hundred and forty years old; and a pear tree, supposed to be two hundred years old. It is an undoubted fact, and worthy of observation, that all the different trees, of the same variety, have a wonderful tendency to similarity of appearance among themselves; and that the parent stock, and all engrafted from it, have a greater resemblance to each other, than can be found in any part of the animal creation; and this habit does not vary to any extent of age. Whatever is said here respecting the apple, is equally applicable to the pear tree. Some years ago, from due investigation and thorough conviction, Mr. B. propagated the principle, that all the grafts, taken from the first tree or parent stock, or any of the descendants, will for some generations thrive; but when this first stock shall, by mere dint of old age, fall into actual decay, a nihility of vegetation, the descendants, however young, or in whatever situation they may be, will gradually decline; and, from that time, it would be imprudent, in point of profit, to attempt propagating that variety from any of them. This is the dogma which must be received as undoubtedly true. From the time the kernel germinates for apple quick, should the plant be disposed to form a valuable variety, there will appear a regular progressive change or improvement in the organization of the leaves, until that variety has stood and grown sufficient to blossom and come to full bearing; that is, from the state of infancy to maturity; and it is this and other circumstances, by which the inquisitive eye is enabled to form the selection, among those appearing likely to become valuable fruits. But from that time, the new variety, or select plant, being compared with all the engraftments which may be taken from it, or any of them, these shall show a most undeviating sameness among themselves. The different varieties of fruit are easily distinguished from each other by many particulars; not only their general fertility, and the form, size, shape, and flavour of the fruit, but also the manner of the growth of the tree, the thickness and proportion of the twigs, their shooting from the parent stem, the form, colour, and consistence of the leaf, and many other circumstances by which the variety can be identified; and were it possible to engraft each variety upon the same stock, they would still retain their discriminating qualities with the most undeviating certainty. Further, if twenty different varieties were placed together, so that each could receive its nurture from the same stem, they would gradually die off in actual succession, according to the age or state of health of the respective variety at the time the scions were placed in the stock; and a discriminating eye, used to the business, would nearly be able to foretell the order in which each scion would actually decline. Should it also happen that two or three suckers, from the wilding stock, had been permitted to grow among the twenty *grafts*, such suckers, or wilding shoots, would continue, and make a tree after all the rest are gone. A further consequence would result from the experiment. Among such a number of varieties, each of the free growers would starve the delicate, and drive them out of existence only so much the sooner. It must be observed, that this supposed stem is the foster parent to the twenty scions, and real parent to the suckers; and those least conversant with engrafted fruits know the advantage acquired by this circumstance. By an experiment, says Mr. B., we have had in hand for five years, it will appear, that the roots and stem of a large tree, after the first set of scions are exhausted or worn out, may carry another set for many years; and we suspect a third set, provided engrafting is properly done, and the engrafter chooses a new variety. To express the concluding sentiments of Mr. B. in a few words, he maintains, that the different varieties of the apple will, after a certain time, decline and actually die away, and each variety, or all of the same stem or family, will lose their existence in vegetation; yet, after the debility of age has actually taken possession of any variety, and the vital principle is nearly exhausted, a superiour care and warmth will still keep the variety in existence some time longer. This, he observes, is an abstruse subject, very little understood, and requiring at first some degree of faith, observation, and perseverance. Mr. B. is fully convinced that we have the power of multiplying a single variety, to whatever number we please; and although these trees may amount to millions, yet, on the death of the primogeneous or parent stock, merely from old age or nihility of growth, each individual shall decline, in whatever country they may be, or however endued with youth and health. Nothing sublunary, which possesses either animal or vegetable life, is exempt from age and death. To exemplify this point more intelligibly, let it be supposed that the *Baldwin apple* is a new variety produced from the seed. This, as the original stock, may continue to live one hundred years. A scion, taken from it when ten years old, may live ninety years; another, taken ten years after, may enjoy a duration of eighty years; and so progressively. At the expiration of one hundred years, the original stock, and all derivatives from it, will become extinct.

METHOD OF FORCING FRUIT TREES TO BLOSSOM AND BEAR FRUIT.

With a sharp knife, cut a ring round the limb or small branch which you wish should bear, near the stem or large bough where it is joined; let this ring or cut penetrate to the wood. A quarter of an inch from this cut, make a second like the first, encircling the branch like a ring a quarter of an inch broad between the two cuts. The bark, between these two cuts, must be removed, clean down to the wood; even the fine inner bark, which lies immediately upon the wood, must be scraped away, until the bare naked wood appears, white and smooth, so that no connexion whatever remains between the two parts of the bark. This barking, or girdling, must be made at the precise time when, in all nature, the buds are strongly swelling, or about breaking out into blossoms. In the same year a callus is formed at the edges of the ring, on both sides, and the connexion of the bark is again restored, without any detriment to the tree or the branch operated upon. By this simple operation, the following advantages will be obtained: 1. Every young tree, of which you do not know the sort, is compelled to show its fruit, and decide sooner whether it may remain in its present state, or requires to be grafted. 2. You may thereby, with certainty, get fruit of a good sort, and reject the more ordinary. The branches so operated upon, are hung full of fruit, while others, that are not ringed, often have none or very little on them. This effect is explained from the theory of the motion of the sap. As this ascends in the wood and descends in the bark, the above operation will not prevent the sap rising into the upper part of the branch, but it will prevent its descending below this cut, by which means it will be retained in and distributed through the upper part of the branch in a greater portion than it could otherwise be, and the branch and fruit will both increase in size much more than those that are not thus treated. The twisting of a wire or tying a strong thread round a branch has been often recommended as a means of making it bear fruit. In this case, as in ringing the bark, the descent of the sap in the bark must be impeded above the ligature, and more nutritive matter is consequently retained, and applied to the expanding parts. The wire or ligature may remain in the bark. Mr. Knight's theory, on the motion of sap in trees, is "that the sap is absorbed from the soil by the bark of the roots, and carried upward by the alburnum of the root, trunk and branches; that it passes through the central vessels into the succulent matter of the annual shoots, the leaf-stalk and leaf; and that it is returned to the bark through certain vessels of the leaf-stalk, and descending through the bark, contributes to the process of forming the wood. A writer in the American Farmer says, he tried the experiment of ringing some apple, peach, pear, and quince trees on small limbs, say from an inch to an inch and a quarter in diameter. The result was, the apples, peaches, and pears were double the size on those branches, than on any other part of the trees: in the quinces there was no difference. One peach, the heath, measured, on a ringed limb, in circumference 11¼ inches round, and 11¾ inches round the ends, and weighed 15 ounces.

The limbs above the ring have grown much larger than below it.

NURSERY.

It has been a received opinion, that the soil for a nursery should not be made rich, as the plants, when removed to a more fertile soil, will flourish more luxuriantly; but later observation has decided that the reverse of this will be found correct. There is a close analogy between vegetable and animal life; and it is a dictate of nature that both require a full supply of nutriment from their earliest existence. It would be absurd to suppose that the tender roots of young seedlings are capable of drawing sufficient nutriment from a rank, barren, and uncultivated soil, and those that are barely supported, or nearly starved at first, will never afterwards become vigorous, stately and handsome, though surrounded by the richest mould. Repeated experiments have proved that a strong and vigorous plant, that has grown up quickly, and arrived at a considerable magnitude in a short time, never fails to grow better after transplanting, than another of the same size that is older and stinted in its growth. Where the soil is poor and lean, trees, in every stage of growth, are observed to be languid, weak, and stinted; while those reared in a good mellow soil always assume a free growth, and advance with strength and vigour. It is evident, therefore, that the ground to be occupied for a fruit nursery, requires to be made rich and fertile. The soil should also be deep, well pulverized, and cleared of all roots and weeds. The seeds may be sown either in autumn or in April, and in one year after, the young plants may be taken up and replanted in the nursury. It is important that the situation be such as to admit of a free circulation of air, and open to the sun, that the plants may be preserved in a healthy condition. Plants reared in a confined and shaded situation in a large town, and removed to an open exposure in the country, will long continue in a debilitated condition; like a puny city invalid, their growth will be greatly impeded, and many years will elapse before they attain to a state of vigour, health, and hardihood.

From the observations in the preceding pages, it is obviously important, that the seed, to be planted in nurseries, should be selected from fruit of a superiour quality. John Kenrick, esquire, of Newton, Massachusetts, has, however, adopted the following method. Take the pumice from late-made cider, separate the seeds by means of a riddle sieve, mix them with a quantity of rich loam sifted fine; put this into a box and expose it to the weather during winter. In April, the earth and seeds are put into a basket, and washed until the seeds are separated, when they are planted in a naturally rich soil, thoroughly pulverized, and well prepared with rotten manure and leached ashes. The seeds are planted in straight, parallel rows, three feet apart, and about two inches deep; the plants, if too thick, may be thinned to about six inches apart, by pulling up the feeblest. The plants should be kept clear of weeds, annually manured, and properly pruned. Young trees should be effectually secured from sheep and horned cattle, in every stage of their growth.

In Marshall's Rural Economy it is directed, that the seedling plants, when taken from the seed bed, be sorted agreeably to the strength of their roots, that they may rise evenly together. The tap, or large bottom root, should be taken off, and the longer side rootlets should be shortened. The young plants should then be set in rows, three feet apart, and from fifteen to eighteen inches asunder, in the rows; care being taken not to cramp the roots, but to bed them evenly and horizontally among the mould. In strictness of management, they ought, two years previous to their being transferred to the orchard, to be retransplanted into unmanured double dug ground, four feet every way apart, in order that the feeding fibres may be brought so near the stem, that they may be removed with it into the orchard, instead of being, as they generally are, left behind in the nursery, Hence, in this second transplanting, as in the first, the branches of the root should not be left too long, but ought to be shortened in such a manner as to induce them to form a regular globular root, sufficiently small to be removed with their plants, yet sufficiently large to give it firmness and vigour in the plantation. It is reported, that the *agricultural society of Nova Scotia* has found, by experience, that apple trees, raised from seeds, if transplanted from the seed bed, in time, (having the tap root cut off,) may be rendered fit for grafting one or two seasons earlier than if left in the place where the seeds were sown. While in the nursery bed, the young plants require to be frequently hoed; the earth should be kept loose, and entirely free from weeds; and, in a very dry season, they should be occasionally watered. When two years old, they will be in a proper condition to receive the scions, or buds, which are intended for them, as the operation is then more easy and certain than when the stocks are older.

ENGRAFTING.

The art of engrafting has not, it is believed, been traced to its origin. In a treatise, published by Parkinson, in 1629, both grafting and inoculating are mentioned, but the period when the practice commenced has not been ascertained. The great utility and advantage of the art is, however, universally understood. According to Mr. Yates, (letter published in Forsyth's treatise,) the art was introduced into America by Mr. Prince, a native of New-York, who established a nursery in its neighbourhood about sixty years ago. Fruit trees, which are grafted or inoculated, come into a bearing state several years sooner than those produced from seed; besides, grafted or inoculated trees invariably produce the same kind of fruit as the parent tree from which the scion or bud is taken, while that from seedling trees is liable to sport in endless varieties. In the choice of scions for grafting, the first essential requisite is, that they are of the same genus and natural family with the stock which is to become their foster parent, and which is to afford them future nourishment and support. The apple cannot be advantageously engrafted on a pear stock, nor will a pear succeed well on an apple stock; for, although it may flourish and bear fruit for a few years, it will never prove a profitable tree, and will decline and decay sooner than others. Scions from a winter apple tree should not be grafted on a summer apple stock, because the sap in the summer stock is liable to decline and diminish before the winter fruit has become fully ripe. In the memoirs of the American academy of arts and sciences, volume I, page 388, is a communication from the late honourable B. Lincoln, relative to the engrafting of fruit trees, &c. in which he says, "I had observed, for a number of years, an apple tree in my orchard, the natural fruit of which was early, having been grafted with a winter scion, producing fruit very like in appearance to the fruit produced by the tree whence the scion was taken, but destitute of those qualities inherent in that fruit, and necessary to its keeping through the winter. This led me to call in question the propriety of grafting winter fruit on a summer stock," &c. A pear is occasionally engrafted on a quince, for the purpose of dwarf trees, but it is of smaller growth, and less vigorous and durable than if nourished by its more natural parent. It is next important, that scions be taken from trees that have attained to the maturity of full bearing. Perhaps cultivators, in general, are not apprized of the fact, that, if a scion be taken from a seedling tree of one or two years old, it will retain the character and undergo the same annual change as the seedling tree itself, whatever be the age of the stock into which it is inserted; and that it will remain unproductive of fruit, until the seedling tree has acquired its proper age and maturity. It is strongly to be suspected, that nursery men, either from ignorance or indifference, have disregarded this circumstance, and imposed upon purchasers trees of this description, by which their just expectations have been disappointed. Scions are directed to be cut in March, before the buds begin to swell; and in order to preserve them in good condition for grafting, they must be placed, with their lower ends in the ground, in some dry part of the cellar, till wanted. But some experienced operators prefer cutting their scions as near the time they are to be employed as may be convenient. Scions should always be taken from the extremities of the most thrifty and best bearing trees, and of the last year's growth, except only just enough of the growth of the year before to fix in the earth, to preserve them moist until they are to be used. In the Edinburgh encyclopedia it is advised to cut the scions several weeks before the season for grafting arrives; the reason is, that experience has shown, that grafting may most successfully be performed, by allowing the stock to have some advantage over the graft in forwardness of vegetation. It is desirable, that the sap of the stock should be in brisk motion at the time of grafting; but by this time, the buds of the scion, if left on the tree, would be equally advanced; whereas the scions, being gathered early, the buds are kept back, and ready only to swell out, when the graft is placed on the stock. The selecting proper scions, the writer observes, is a matter of the greatest importance, if we wish to enjoy the full advantage which may be derived from grafting. They should be taken from a healthy tree in full bearing, and from the outer side of the horizontal branches of such a tree, where the wood has freely enjoyed the benefit of sun and air. If the tree be in a luxuriant state, the grafts are very properly taken from the extremities of bearing branches; but if it be in a debilitated condition, the most healthy shoots in the centre of the tree should be employed. The extremity of the scion should be cut off, leaving four or five eyes or buds, as the middle part affords the best graft. The most proper season for grafting, in our climate, is from about the twentieth of March, to the twentieth of May, though the operation has succeeded well, as late as the tenth of June, provided the scions have been properly preserved. Practical gardeners, it is said, concur in stating, that the nature of fruit is, to a certain extent, affected by the nature of the stock. Crab stocks, for example, cause apples to be firmer, to keep longer, and to have a sharper flavour. Mr. S. Cooper, of New-Jersey, expresses himself as follows, on this subject: (Dom. Ency. Mease's edit.) "I have, in numerous instances, seen the stock have great influence on the fruit grafted thereon, in respect to bearing, size, and flavour, and also on the durability of the tree, particularly in the instance of a number of Vandevere apple trees; the fruit of which was so subject to the bitter rot as to be of little use. They were engrafted fifty years ago, and ever since those of them having tops composed of several different kinds, though they continue to be more productive of fruit than any others in my orchard, yet are subject to the bitter rot, the original and well known affection of the fruit of the primitive stock. I have had frequent opportunities of observing the same circumstance, in consequence of receiving many scions from my friends, which, after bearing, I engrafted, and the succeeding fruit uniformly partook, in some degree, of the qualities of the former, even in their disposition to bear annually or biennally." Mr. C. has ascertained the fact that early and late apples, by being grafted on the same tree, improved in size and flavour more than if but one kind grew on a tree. It should be observed, as a rule, never to employ suckers from old trees as stocks for grafts, or buds, as they have a constant tendency to generate suckers, and thereby injure the growth of the trees.

MODES OF GRAFTING.

The mode of performing this operation is varied, according to the size and situation of the stock to be employed. The small stocks in the nursery, if of such kind as produce an erect strong stem, are usually grafted within or near the surface of the earth, in which case, the mould is brought round them in the form of a little hillock, and nothing more is required. When the stock is naturally inclined to branch out horizontally, the preferable mode is to insert the bud or graft high enough to form a handsome head or top. In this mode of operating, it is necessary to employ some kind of composition or covering in order to secure from injury by the weather, or influence of the sun. The following is commonly used: A quantity of clay or stiff loam is to be worked fine and mixed with some chopped hay or coarse horse-dung. It should be prepared a day or two before hand, and be beat up with a little water as needed. This should be applied closely round the parts in the form of a collar, or ball, tapering at both ends, the upper end being applied closely to the graft, and the under to the stock. A good substitute for the above is a composition of turpentine, bees-wax and rosin melted together; if it prove too hard, it may be softened with a little hog's lard or tallow. This may be applied with a brush while warm, but not too hot. A common sod, applied with the grass side out, is often employed, and is found to answer every purpose. There are several different methods of performing the operation of grafting, in all which, it should be a general rule to adjust the inner bark of the stock and of the scion in close contact, and to confine them precisely in that situation. If this be accurately effected, all species of grafting will prove successful. In that method which is usually called *whip-grafting*, or tongue-grafting, the top of the stock and the extremity of the graft should be nearly of equal diameter. They are both to be sloped of a full inch or more, and then tied closely together. This method may be much improved, by performing what gardeners call *tongueing* or *lipping*; that is, by making an incision in the bare part of the stock, downwards, and a corresponding slit in the scion, upwards; after which they are to be carefully joined together, so that the barks of both may meet in every part, when a bandage of bass wood is to be tied round the scion, to prevent it from being displaced; and the whole is to be covered over with the composition. When the stocks to be grafted upon are from one to two or more inches in diameter, as branches of trees, *cleft-grafting* is generally employed. The head of the stock or branch being carefully cut off in a sloping direction, a perpendicular cleft or slit is to be made, about two inches deep, with a knife or chisel, towards the back of the slope, into which a wedge is to be driven, in order to keep it open for the admission of the scion. The latter must now be cut in a perpendicular direction, and in the form of a wedge, so as to fit the incision in the stock. As soon as it is prepared, it should be placed in the cleft in such manner that the inner bark of both the stock and scion may meet exactly together. It is then to be tied with a ligature of bass, and clayed over, as is practised in whip-grafting, three or four eyes being left in the scion uncovered. It should be observed, that in making the cleft in the stock, care should be taken not to injure the pith, the scions being inserted in the sap wood of the stock or branch. Old stocks may be grafted in the bark, called *crown-grafting*, but this cannot be practised successfully till the sap be in full motion, that the bark may be easily raised from the wood. The head of the stock or thick branch is cut off horizontally; a perpendicular slit is made in the bark, as in budding; a narrow ivory folder is thrust down between the wood and the bark, in the places where the grafts are to be inserted. The graft is cut, at the distance of an inch and a half from its extremity, circularly through the bark, not deeper than the bark on one side, but fully half way through or beyond the pith on the other. The grafts being pointed, and a shoulder left to rest on the bark of the stock, they are inserted into the openings, and either three or four grafts are employed, according to the size of the crown. *Side-grafting* is sometimes employed for supplying vacancies on the lower parts of full-grown fruit trees. The bark and a little of the wood are sloped off for the space of an inch and a half, or two inches; a slit is then made downwards, and a graft is cut to fit the part, with a tongue for the slit; the parts, being properly joined, are tied close and clayed over. When stocks cannot readily be procured, *root-grafting* may be successfully employed. A piece of the root of a tree of the same genus, well furnished with fibres, is selected, and a graft placed on it, tied and clayed in the ordinary way. Thus united, they are set with care in a trench in the ground, the joining being covered, but the top of the graft being left two inches above ground.

"The following new mode of grafting," says Dr. Mease, (Dom. Ency.) "the late Mr. A. C. Du Plaine informed the editor, was long kept a secret in France. A limb of willow, three or four inches thick, was buried in a trench deep enough to receive it, and at the distance of every four or five inches, holes were bored, into which grafts were inserted, care being taken to make the bark of the graft, and the limb into which it was inserted touch; the lower part of the graft was pointed and the bark shaved off. The limb and the grafts were then covered with earth and kept moist, and about two inches of the latter left above the surface. In process of time the limb rotted, and the grafts took root. The different grafts were then dug up and transplanted." In the same valuable publication, Dr. Mease has communicated an account of the mode of Mr. William Fairman, of "*extreme-branch grafting*," upon old decayed trees, "which promises to be of a very great acquisition to those who take pleasure in cultivating fruit." The process is as follows: "Cut away all spray wood, and make the tree a perfect skeleton, leaving all the healthy limbs; then clean the branches, and cut the top of each off, where it would measure in circumference from the size of a shilling to about that of a crown piece. Some of the branches must of course be taken off where they are a little larger, and some smaller, to preserve the canopy or head of the tree; and it will be necessary to take out the branches which cross others, and observe the arms are left to fork off, so that no considerable opening is to be perceived when you stand under the tree, but that they may represent a uniform head. When preparing the tree, leave the branches sufficiently long to allow of two or three inches to be taken off by the saw, that all the splintered parts may be removed. The tree being thus prepared, put in one or two grafts at the extremity of each branch, and put on the cement or composition, and tie with bass or soft strings. Sever the shoots or suckers from the tree until the succeeding spring. To make good the deficiency in case some grafts do not succeed, additional grafts may be inserted in the sides of the branches, or where they are wanted to form the tree into a handsome shape."

BUDDING, OR INOCULATING.

By the process of budding, we obtain the same result as in grafting; with this difference, however, the bud being a shoot in embryo, grafted trees usually produce fruit two seasons earlier than budded trees. Each bud may be considered a distinct being, which will form a plant retaining precisely the peculiarities of the parent stock; and five or six species of fruit may be budded on one tree, which, when attained to the maturity of bearing fruit, exhibit a singular and beautiful spectacle. Buds are formed at the bases of the foot stalks of the leaves, and are of two kinds, those which bear leaves, and those which bear flowers. The leaf buds are small, long, and pointed; the flower buds are thick, short, and round. Both leaves and flowers are sometimes produced by the same bud, and they are generally employed, in budding, without distinction; but the bud should always be of the same genus with the tree or branch, which is to receive it. The blossom buds are formed by the first sap between April and June, and are filled by the second sap between July and October. The proper season for budding, is from the beginning of July to the end of August, at which period the buds for next year are completely formed in the axilla of the leaf of the present year, and they are known to be ready, from their easily parting from the wood. The buds preferred, are the shortest observed on the middle of a young shoot, on the outside of a healthy and fruitful tree; on no account should an immature tree, or a bad bearer, be resorted to for buds. For gathering the shoots containing the buds, a cloudy day, or an early or late hour, is chosen, it being thought that shoots, gathered in full sunshine, perspire so much as to drain the moisture from the buds. The buds should be used as soon after being gathered as possible, and the whole operation should be quickly performed. In taking off the bud from the twig, the knife is inserted about half an inch above it, and a thin slice of the bark, and wood along with it, taken off, bringing out the knife about an inch and a half below the bud. This lower part is afterwards shortened and dressed, and the leaf is cut off, the stalk being left about half an inch long. Perhaps it is better to insert the knife three quarters of an inch *below* the bud, and to cut upwards; at least, this mode is practised in the Scottish nurseries. The portion of wood is then taken out by raising it from the bark, and pulling it downwards or upwards, according as the cut has been made from above or below. If the extraction of the wood occasion a hole at the bud, that bud is spoilt, and another must be prepared in its stead; as gardeners speak, the root of the bud has gone with the wood, instead of remaining with the bark. For the performance of the operation, provide a sharp budding-knife, with a flat thin haft, of ivory, suitable to open the bark of the stock for the admission of the bud, and also with a quantity of bass strings, or shreds of Russian mats, or woollen yarn, to bind round it when inserted. On a smooth part of the bark of the stock a transverse section is now made through the bark down to the wood; from this is made a longitudinal cut downward, about an inch and a half long, so that the incision may somewhat resemble a Roman T; by means of the flat ivory haft of the budding-knife the bark is raised a little on each side of the longitudinal incision, so as to receive the bud. The prepared bud is placed in the upper part of the incision so made, and drawn downwards; the upper part is then cut off transversely, and the bud pushed upwards till the bark of the bud and of the stock join together. It is retained in this situation by means of tying with strands of bass, matting, or woollen yarn, applied in such manner as to defend the whole from the air and sun, but leaving the leaf stalk, and the projecting part of the bark, uncovered. In about a month after the operation, the tying is slackened; buds, that have taken, appear swelled, and the foot stalk of the old leaf falls off on being slightly touched. All shoots that spring below the budded part are carefully cut off. The head of the stock is not removed till the following March; after this, the bud grows vigorously, and, in the course of the summer, makes a considerable shoot. Against the next spring, the shoot is headed down in the manner of young grafted trees.

According to the improved mode of Mr. Knight, the operation of budding is thus performed. In the month of June, when the buds are in a proper state, the operation is performed by employing two distinct ligatures to hold the buds in their places; one ligature is first placed above the bud inserted, and upon the transverse section through the bark; the other, the only office of which is to secure the bud, is applied in the usual way; as soon as the buds have attached themselves, the lower ligatures are taken off, but the others are suffered to remain. The passage of the sap upwards, is, in consequence, much obstructed, and the inserted buds begin to vegetate strongly, in July; when these afford shoots about four inches long, the upper ligatures are taken off to permit the excess of sap to pass on; the wood ripens well, and affords blossoms, sometimes, for the succeeding spring. It will be perceived, that instead of the usual mode of budding, after the commencement of the autumnal flow of sap, and keeping the bud without shooting until the following spring, when the top of the stock is cut off, this improved mode gains a season in point of maturity, if not of growth, and has the effect of grafting the preceding spring, in all cases where the bud sprouts in proper time to form a strong shoot, capable of sustaining, without injury, the frost of the ensuing winter.

ANOTHER METHOD OF BUDDING.

The common method of budding fruit trees, is, by cutting crosswise into the bark of the stem, and making a perpendicular cut from thence *downwards*: the bud is then made to *descend* to the position intended for it. The reverse of this ought to happen; the perpendicular cut should rise *upwards*. This last method rarely fails of success. The reason is derived from the fact, that the sap *descends* by the bark, instead of rising; whence the bud, if placed above the transverse cut, receives abundance of sap, which it loses, if placed below it. The incision, which is to receive the bud, should resemble the capital, inverted, thus, ⊥, and the barks should be adjusted accordingly. It is asserted by Mr. Forsyth, that whenever an incision is made for budding, or grafting, the parts about the incision are very liable to be affected with the canker. As a preventive and curative remedy, he strongly recommends, as soon as the incision is made, and the bud or graft inserted, to rub in with the finger or brush, some of his composition, before the bass strings are tied on; then cover the bass strings all over with the composition, as thick as it can be laid on with a brush; and this, he thinks, is preferable to clay. It should be observed as a rule, not to slacken, too soon, the bass strings, which are wrapped round the bud; and if the bark of the stock is found spreading open, the ligature must be carefully tightened, and suffered to remain some time longer. Mr. Yates, of Albany, says, that to satisfy his curiosity, he made the experiment of budding in the spring, when the sap juice is in full motion, and found it to succeed; but the insertion of the bud is more difficult than to do it in the summer season. A tree thus inoculated, will bear fruit one year sooner than one budded in the next summer season, and as soon as one budded the summer preceding.

NURSERY PRUNING.

Young trees properly pruned in the nursery, will, it is said, come to bearing sooner, and continue in vigour for nearly double the common time. All superfluous or rambling branches should be taken off annually, and only three or four leading shoots be left to every head. Thus managed, the trees will not require to be lopped for a considerable time; and as they will have no wounds open in the year when transplanted, their growth will be greatly promoted. The more the range of branches shoots circularly, inclining upwards, the more equally will the sap be distributed, and the better the tree bear. Mr. Cooper, a very intelligent cultivator, remarks, that the side shoots should not be cut close to the stem, as the whole growth is thereby forced to the top, which becomes so weighty as to bend and spoil the tree. A better method is, to cut the ends of the side shoots so as to keep the tree in a spiral form, which will encourage the growth of the trunk, until it acquires strength to support a good top. The side shoots may then be cut close. In forming the top, Mr. C. has found it necessary to lighten the east and northeast sides, as fruit trees generally incline that way; and to encourage the branches on the opposite quarters, to keep the sun from the trunk; otherwise, the rays of that luminary, when striking at nearly right angles, will kill the bark, bring on canker, and ruin the tree. In Marshal's Rural Economy, we have the following directions. In pruning the plants, the *leading shoot* should be particularly attended to. If it shoot double, the weaker of the contending branches should be taken off. If the leader be lost and not easily recoverable, the plant should be cut down to within a hand's breadth of the soil, and a fresh stem trained. Next to the leader, the stem boughs require attention. The undermost boughs should be taken off by degrees; going over the plants every winter; always cautiously preserving sufficient heads to draw up the sap, thereby giving strength to the stems, and vigour to the roots and branches; not trimming them up to naked stems, as is the common practice, thereby drawing them up prematurely tall and feeble in the lower part of the stems. The thickness of the stem ought to be in proportion to its height; a tall stock therefore requires to remain longer in the nursery than a low one. We have the respectable authority of Mr. T. Pickering, that such trees as are tall should be cut down close to the ground, to prevent their being shaken by the wind, and to promote their growth. It may seem strange, he observes, to advise the cutting down a tall, well-grown plant, yet it is necessary; for the roots are always hurt and shortened by the removal; it is impossible for those that remain, to nourish the same body; this is the reason we so often find our trees dead at top and hide-bound. Should my directions, he says, be followed, which are from thirty years experience, such vigorous shoots will spring up, as will in ten years become much larger trees than if they had stood uncut for forty years; and the bark and every appearance of the tree will be like one from the seed, and much trouble will be saved in staking, to prevent their ruin from the wind. This method has not, we believe, been very frequently adopted, although recommended by other cultivators beside the venerable author just cited, the result of whose long experience, and the reasons assigned for the practice, must be deemed satisfactory. It has been stated by an English author, that when young trees are planted out from the nursery, as soon as they begin to break in the spring, they are to be cut down to three or four eyes, according to their strength, to furnish them with bearing wood. If this were not done, they would run up in long naked branches, and would not produce one quarter of the fruit which they would when this is properly performed.

ORCHARD. PLANTING AND CULTURE.

It is an object of no inconsiderable importance to select the most eligible soil, situation and aspect for laying out a fruit orchard. With respect to soil, it should be of a rich loamy nature, neither too wet or heavy, nor too light or dry. Those fertile fields or pastures which produce abundant crops of corn, grass, and other vegetables, will in general be found well adapted to the growth of fruit trees. But in all cases, the soil should be suited to the particular kind of fruit. In Herefordshire, a celebrated cider county, in England, it is said to be a fact well ascertained, that scions from the same tree, grafted upon similar stocks, and planted in different soils, will produce cider of different qualities. It is also found that the early fruits obtain the greatest perfection in a sandy soil, and that the late fruits succeed best when planted in a strong clay. The best cider orchards are on a strong clayey soil; for it seems to be admitted that the cider from trees in clay is stronger, and will keep better, than cider made from trees on a sandy soil. But again, as applicable to our own country. "The choice of a proper soil and exposure," says Dr. Mease, (Dom. Ency.) "is not sufficiently attended to in the United States. Mr. Riley, of Marcus Hook, whose experience in cider is inferiour to none, assures the editor, that apples growing in a good loose soil, produce much more rich and generous liquor than those that grow in a stiff clayey land." An orchard, says an English writer, should rather be elevated than low, as on a gentle declivity open to the south and southeast, to give free admission to the air and rays of the sun, as well as to dry up the damp, and dissipate fogs, in order to render the trees healthy, and give a fine flavour to the fruit. It should likewise be well sheltered from the east, north, and westerly winds. The blossoms of apple trees are liable to be injured by spring frosts, when the trees are planted in the lowest parts of a confined valley. In the domestick encyclopedia, Dr. Mease has inserted an excellent paper on the climate of the United States, by colonel Tatham, from which I extract as follows. "It is a fact that in those western parts of the United States, which have a high exposure to the winter's blast, the northern sides of a ridge or mountain arrive sooner and more certainly at a state of perfect vegetation, than the south sides, which are laid open to the power of the sun. I account for this phenomenon as follows: I suppose that the southern exposure to the vehement rays of the sun, during the infant stages of vegetation, puts the sap in motion at too early a period of the spring, before the season has become sufficiently steady to afford nurture and protection to the vegetating plant, blossom or leaf; and when in this state, the first efforts of vegetation are checked by the chilling influence of cold nights, and such changeable weather as the contest between winter and spring is ever ready to produce, in their apparent struggles to govern the season. On the contrary, the northern exposures, which are not so early presented to the vivifying influence of the sun, remain, as it were, in a torpid state until the more advanced period of the spring, when all danger of vegetation being checked, is over." I have long entertained the opinion, says Mr. Yates, that an orchard, exposed to the north, where the ground in the spring of the year continues longer bound by frost, which retards the vegetation, would be preferable to one bearing an easterly or southern aspect, where the sap-juice is sooner in motion, and accelerated by the rays of the sun. The rows of trees in an orchard ought to incline to a point of compass towards the east; because the sun will shine upon them early in the forenoon, and thus dissipate the vapours which arise during the vernal nights, and stint the fruit in the earlier stages of its growth. The trees should be arranged in uniform straight rows, as being most convenient to the husbandman, and at the same time exhibiting the most pleasing view to the tasteful eye. The distance in the rows or squares, will depend on the size and form of the full grown tree, and on various other circumstances connected with the future intentions and views of the proprietor. In every instance, however, the distance should be such as to prevent the extreme branches from locking into each other when attained to full maturity of growth. Miller, an experienced English horticulturalist, says, when the soil is good, the distance should be fifty or sixty feet, and where the soil is not so good, forty feet may be sufficient. Lawson, who wrote in 1626, observes, that in a good soil and under proper management, apple trees will, in forty or fifty years, spread twelve yards on each side; and the adjoining tree spreading as much, gives twenty-four yards, or seventy-two feet, and the roots will extend still further. He therefore recommends that apple trees be set at the distance of eighty feet from each other. The advantages of thin planting are said to be; 1. The sun refreshes every tree, the roots, body, and branches, with the blossoms and fruit, whereby the trees are more productive, and the fruit larger, fairer and better flavoured. 2. The trees grow larger, and are more healthy and durable. 3. When trees are planted too near, the lower branches are smothered for want of sun and air, the fruit is never well flavoured, and always small. The object is fruit, and we are not to expect that the quantity will be in proportion to the number of trees in an orchard, for a few trees of a large size will produce more and better fruit, than six or eight times the number of those which grow near and crowd one another. Again, apples are not to be estimated according to their number only, but their size and weight, as well as their superiour flavour. Another advantage is the profit of cultivating the ground under and about the trees. The intervening spaces may be cultivated with various vegetables, or if preferred, they may be filled with some temporary trees of small growth, as dwarfs, which may be removed when the principal standards have attained to a large size. Many apple trees have borne fruit for more than a century; and when trees show signs of decay at the age of thirty or forty years, it is in general to be attributed to mismanagement, and probably to close planting. Every cultivator must have experienced the great inconvenience occasioned by narrow and crowded intervals. When apple trees stand at the distance of twenty-five or thirty feet only, their horizontal branches will, as we frequently see, in fifteen or twenty years interlope each other, and almost entirely obstruct the intervals between them. Taking into view, therefore, the foregoing particulars, the cultivator, in planting a young orchard, will determine for himself the most convenient and suitable width of the intervals between his trees. The most generally approved distance is forty feet in all directions, and this gives twenty-seven trees to an acre, while at thirty feet apart, an acre will contain forty-eight trees, and at thirty-five feet distance, thirty-five trees occupy an acre.

With respect to the most proper season for planting apple trees in the United States, different opinions prevail. According to Dr. Mease, no general rule can be given, owing to the immense variety of climates with which we are favoured. In some states, the autumn may be best, while in others, in Pennsylvania, it is probable that early in the spring answers best. Indeed, in a comparative experiment of spring and autumn planting, made near Philadelphia, in 1802–3, the advantage was *considerably in favour* of those put down in the spring. Some, planted in autumn, were from a nursery near the city, and nearly all died; another parcel, from the excellent nursery of Mr. Prince, of Flushing, Long Island, arrived late in April, and all survived. There was no reason to suspect any difference in the soil, or the care with which both parcels were planted. E. Preble, esquire, of Boston, is decided in preferring autumn to spring, for planting apple trees, as the ground will settle round the roots before frost, and the trees prepared to shoot in the spring, aided by the rains which prevail at that season. If planted in spring, he observes, the drought and heat of summer will injure, if not destroy them, before the roots find their place. He is in the practice of transplanting them as soon as the foliage is off in autumn, and farmers have more leisure at that season of the year.

PREPARATION OF THE LAND, AND PLANTING.

When the ground is in pasture, it should be ploughed to a considerable depth, and well summer fallowed, till the grass be killed. But, if trenching should be preferred, the spade must be carried to the full depth of the soil; and if it be gravelly, a considerable portion of this should be removed, and its place supplied by a due quantity of rich mould. The quality of the soil should approach as nearly as possible to that of the nursery, in which the trees were reared. If it be poorer, the trees will certainly be impeded in their growth. The trenches should be well dug, about five or six feet wide, that the holes to receive the roots may be made sufficiently large. Much of the future prosperity of the orchard depends upon a judicious selection of the trees. Mr. Bucknal advises, that they be chosen the year before they are intended to be planted, particular care being taken to obtain young, vigorous and healthy trees; for cankered plants emit a vapour that is very detrimental to such as are sound. In taking up the trees from the nursery, the roots should be preserved of the full length, if possible; the surface earth should be removed, and the running roots carefully traced and raised. If they must be cut, let it be done with a sharp instrument, and not hacked with a dull spade. The tap root, or that which penetrates straight down, may be shortened to the length of about one foot, and all broken or bruised parts should be removed. The small matted fibres should be cut off, as they are apt to mould and decay, and prevent new ones from shooting. The remaining side roots should be spread out to give them a horizontal direction under the surface, that they may be more immediately influenced by the sun, and their sap will become richer, and produce the sweetest and most beautiful fruit. Some well-rotted manure, mixed with mould, may be advantageously placed round the roots, the earth carefully pressed down, so as to come in contact with the roots in every part, and the trees placed the same side to the sun as they stood before. In transplanting trees, it may be observed, that they should not be replanted deep in the soil, since the most nutritive or salubrious parts of the earth are those within the reach of the sun's warmth, of the descending moisture, and of the air. And as the root fibres of trees, like those of seeds, always grow toward the purest air and brightest light, it follows, that the root fibres seldom rise higher in the ground than they were originally set, and seldom elongate themselves perfectly horizontally; so that when a fruit tree is planted too deep in the earth, it seldom grows in healthy vigour, either in respect to its leaf buds or flower buds. For a more particular description of the method of planting fruit trees, I quote the language of Mr. Marshall, as follows: "Describe a circle about five or six feet diameter for the hole. If the ground be in grass, remove the sward in shallow spits, placing the sods on one side of the hole; the best of the loose mould placed by itself on another side, and the dead earth, from the bottom of the hole, in another heap. The depth of the holes should be regulated by the nature of the sub-soil. Where this is cold and retentive, the holes should not be made much deeper than the cultivated soil. To go lower, is to form a receptacle for the water, which, by standing among the roots, is very injurious to the plants. On the contrary, in a dry, light soil, the holes should be made considerable deeper; as well to obtain a degree of coolness and moisture, as to be able to establish the plants firmly in the soil. In soils of a middle quality, the hole should be of such depth, that when the sods are thrown to the bottom of it, the plant will stand at the same depth in the orchard as it did in the nursery. Each hole, therefore, should be of a depth adapted to the particular root planted in it. The holes ought, however, for various reasons, to be made previous to the day of planting. If the season of planting be spring, and the ground and the weather be dry, the holes should be watered the evening before the day of planting, by throwing two or three pails full of water into each; a new but eligible practice. In planting, the sods should be thrown to the bottom of the hole, chopt with the spade, and covered with some of the finest of the mould. If the hole be so deep, that with this advantage the bottom will not be raised high enough for the plant, some of the worst of the mould should be returned before the sod be thrown down. The bottom of the hole being raised to a proper height and adjusted, the lowest tier of roots is to be spread out upon it; drawing them out horizontally, and spreading them in different directions, drawing out with the hand the rootlets and fibres which severally belong to them, spreading them out as a feather, pressing them evenly into the soil, and covering them, by hand, with some of the finest of the mould; the other tiers of roots are then to be spread out and bedded in the same manner. Great care is to be taken to work the mould well in, by hand, that no hollowness be left; to prevent which, the mould is to be trodden hard with the foot. The remainder of the mould should be raised into a hillock, round the stem, for the triple use of affording coolness, moisture, and stability to the plant. A little dish should be made on the top of the hillock, and from the rim of this the slope should be gentle to the circumference of the hole, where the broken ground should sink some few inches below the level of the orchard. All this detail may be deemed unnecessary; by those, I mean, who have been accustomed to bury the roots of plants in the gravedigger's manner; but I can recommend every part of it to those who wish to insure success, from my own practice. Plants which have been transplanted in the manner here recommended, whose heads have been judiciously lessened, and which have been planted in the manner here described, seldom require any other stay than their own roots. If, however, the stems be tall, and the roots few and short, they should be supported in the usual manner, with stakes, or rather, in the following manner, which is at once simple, strong, and most agreeable to the eye. Take a large post, and slit it with a saw, and place the parts flat-way with the faces to the plant, one on each side of it, and two feet apart, and nail your rails upon the edges of the posts.

It seems to be a well-founded opinion, that young apple trees will not flourish advantageously if planted on the site of an old orchard, or near the place where old trees have died. William Coxe, esquire, of New Jersey, the most experienced orchardist in the United States, has experimented with the view of ascertaining this fact; and the result has demonstrated the correctness of it in the clearest manner. He planted young trees in the middle space between the old rows, and sometimes near the stumps of old trees, which had been for many years cut down and decayed; he removed the old soil in digging the holes, and replaced it with rich earth mixed with manure, and gave to his trees all the advantage of high cultivation, yet they were manifestly inferiour in point of growth and vigour to those which were planted at the same season in his adjoining lots.

Having progressed thus far, the husbandman is now presented with a valuable orchard, planted and arranged in complete systematick order; and it may, if he please, be considered as the work of his own hands, from which he may anticipate high expectations of profit and amusement. Thus the value of a farm is greatly augmented, and the proprietor enjoys the satisfaction of bequeathing a rich inheritance to future generations. But his labour is not yet at an end; it will still require his fostering care, and unremitted attention. In vain do we plant, labour, and toil, if through neglect in a single point, we suffer our harvest to be wrested from our hands. Nor are we less culpable if we suffer a young orchard to be destroyed by the depredations of cattle, the annoyance of insects, and the corroding canker, without applying the appropriate remedies. We suppose, then, of course, that the orchard is properly enclosed by a strong and close fence. We next proceed to cultivate the soil beneath, and between the trees, until they arrive at their complete size, as the quality, excellence, and maturity of the fruit will, in a great measure, depend upon its proper culture. This process may be performed either with the plough, if due care be taken not to injure the roots, or with the spade around the trunks, and by these means both the fertility and health of the trees are promoted, and the soil itself improved for the purpose of raising potatoes, turnips, or other vegetables, which do not tend too much to impoverish the land. If, however, it is intended to cultivate clover, or other meadow grass for mowing, still it will be advisable to reserve a circuit round each tree, as extensive as the roots, to be kept open by tillage, that by frequent hoeing the fertilizing properties of rain, air, and dew, may more easily penetrate into the earth, and produce beneficial effects on the roots. The opinion prevails among some farmers, that clover has a tendency to retard the growth of fruit trees. If this be true of clover more than of any other grass, it may probably be explained from its luxuriant foliage secluding the influence of warmth, air, and light, from their roots. Mr. Kenrick, of Newton, observes, that he has found herds grass the most injurious to his trees.

MANURING.

It is well known to every farmer, that young fruit trees will flourish luxuriantly, while the ground is cultivated with various vegetable crops, and that the same tillage and manuring, which is required for the latter, will prove highly conducive to the growth and fertility of the former. In fact, it has been ascertained by experience and observation, that apples, pears, peaches, &c. attain to their highest perfection only when the soil about the roots is kept open, and frequently manured. It is by the chemical combination of air, warmth, and moisture, that the growth and vigour of plants and trees are essentially promoted and maintained. The process of nature is greatly assisted by such substances as cause the greatest degree of fermentation, when buried in the earth. Hence, all animal substances, from the great degree of fermentation created by their dissolution, will be found productive of the greatest utility. Among these, are dead animal bodies, horns, hoofs, bones, when reduced to fragments or powder, leather, shells, &c. To which may be added hair, wool, and woollen rags. These, applied to the roots, and a top dressing of swamp or pond mud, chip or compost manure, annually, or once in two years, will produce surprising effects, and the farmer will realize ample compensation by the increased quantity and improved quality of his crop. As an extraordinary instance of resuscitating an old worthless apple tree, by the application of manure, I quote from the Dom. Ency. a statement, which appeared in the Salem Register, of May, 1802. "In my garden is an apple tree, which, about the year 1763, sprouted from the root of a former tree: it now girts three feet six inches. From 1784 to 1790, I observed it to be barren, and a cumberer of the ground; year after year, being the prey of caterpillars, and exhibiting the constant appearance of innumerable warts within the outside bark, which, at the time, I suspected was natural instinct in the insect for the propagation of its kind. In the spring of 1793, I tried an experiment for giving it new life, as follows: very early in the season, I directed my gardener with a hoe to cleanse the outside bark of such excrescences as might bear the operation with little difficulty. In the next place, I directed him to raise a wall of small stones round the tree, at the distance of one foot, and perhaps nine inches high, and then to fill the cavity with manure from the resource of compost. The effect in the succeeding season was truly worthy of notice. The warts disappeared, the bark clean and thrifty, and the tree so loaded with fruit as that about one third of the boughs broke and came to the ground with the cumbersome weight. Comparatively no caterpillars since, and, on an average, a very plentiful crop of fruit yearly. I was led to the experiment by taking notice of a pear tree that had been in a very similar situation, and had been resuscitated in a similar manner."

There is not, perhaps, in nature a more fertilizing application than the liquid substance which is left at the bottom of stercoraries and barn-yards, after the more solid substance has been removed. This effervescing mixture contains the very essence of the food of plants, and it might be carried out in tight carts or casks, especially in a dry season, and emptied about the trunks and roots, in the cool hours of morning and evening, but on no account during the heat of a summer's day. The planter, however, ought to be apprized, that the process of manuring must not be carried to excess, as too great a stimulus applied to trees, facilitates the luxuriant growth of wood, and renders the branches less productive of fruit: or the trees may be stimulated to a preternatural exertion for a few years, when their prolifick powers will be exhausted, and a premature decay induced. Fresh stable manure is supposed to be injurious to fruit trees.

There is another expedient, which is understood to have produced favourable effects in promoting the growth of young fruit trees, especially in grass land. The method was published some years ago by a German clergyman, and simply consists in spreading flax-shaws, or the refuse of flax after it has been dressed, on the soil contiguous to the trunks of the trees, as far as the roots extend; by which means their size, as well as their fertility, is remarkably increased. In the vicinity of the sea-coast, a valuable substitute for refuse flax, may be found in fresh sea weed. I have employed this article with considerable advantage. Being laid thick round the trunk, it prevents the growth of grass and weeds, keeps the earth open and loose, and, I am disposed to believe, prevents field mice from injuring the bark of the trees in winter, as the salt with which this substance is impregnated is supposed to be obnoxious to those vermin. It occurs to me as highly probable, that a quantity of sea weed pressed round the trunks of fruit trees, extending three or four feet, would prove a remedy against the canker worm, by forming a compact substance, through which both the canker moth and worm would be unable to penetrate. It might also serve as a protection against the destructive worm, which bores into the tree near the surface of the earth.

Engrafted apple trees sometimes put forth blossoms and bear fruit when two or three years old; but if this premature produce be permitted, the prolifick powers will be greatly impaired, and the trees will suffer irreparable injury. If, therefore, the blossoms appear abundant, the fruit should be taken off as soon as formed, leaving only four or five apples on each tree, to ascertain their size and quality. Even at a more advanced stage of growth, if part of the apples are taken off in season, the remainder will be much improved in all respects, and the trees will not only produce fruit in higher perfection, but the bearing branches will every year become more vigorous and fruitful. It has been observed, that trees, which begin their bearing gradually, are, in general, more disposed to afford an annual crop.

It is not to be expected, that the systematick plan and particular rules described in the foregoing pages, will accord with the views and circumstances of every agriculturalist. It may, in some instances, interrupt a course of field culture which the farmer has prescribed for himself, or his farm may not afford an eligible situation for a regular plantation of fruit trees. In such dilemma it may be convenient to plant trees in various parts of the farm, not otherwise occupied, as on the borders and corners of fields contiguous to roads, lanes, &c. In some instances, it is deemed a preferable method to set trees on the sides of a square field, the centre of which is left open for pasture or tillage; and such arrangement is not without its advantages. It has been observed, that apple trees produce a more abundant crop when the ground is trodden and manured by cattle in the winter; but they should by no means be suffered to browse on the branches. We are not, indeed, without examples of scattered trees, of spontaneous growth, occupying land which has never been broken by the plough, nor subjected to the hand of culture. From these, tolerable crops of fruit are occasionally obtained, which, although of inferiour quality, are nevertheless capable of being converted to useful purposes. With the view of showing the facility with which many natural disadvantages may be overcome, and an orchard reared in the most unpromising situation, I shall introduce here an extract from a valuable paper, published in the Agricultural Repository, No. 1. vol. 6, by John Wells, esquire, of Dorchester. Mr. W. relates two instances of cultivating apple trees successfully in unfavourable situations. In the one, a low piece of strong stony land was taken. "As it was rather flat, it was ploughed in strips or dug in spaces about four feet square. As it was necessary to plough a furrow between each row, the mode of ploughing in strips was found the best, as by turning the furrow towards the tree, the land was better drained. Besides raising the ground a little from the surrounding soil, half a buck load of loam was added, to raise the ground on which the tree was set. After this was done, the strips or squares, as the case might be, were appropriated to the culture of potatoes and garden vegetables. In a few places only, the trees failed from the insufficiency of the drain. But by opening the drain, and raising the ground by half a buck load of loam, I found, on setting out a new tree, it flourished equally with the rest. This orchard, now in eight years, is a most valuable one, and most of the trees would give half a barrel of apples. From this and other circumstances which have fallen within my observation, it appears that low land, if strong soil, and well drained, will give a fine orchard, and probably sooner than any other."

The next effort was made under totally opposite circumstances. "The object was to have an orchard on a particular spot, where the soil was thin and light, upon a plain or flat. The holes were dug four feet over. The two upper strata of black and yellow loam, were placed aside the tree. After this, about ten inches in depth of the gravelly, or poorer earth, was taken out and carted off, and a horse cart load of stones upset into the hole; upon these, a part of the upper stratum, or some dirt from the side of the road was scattered so as to fill up the interstices; since which the spots near the trees have been cultivated by planting four hills of potatoes round each tree. The result has been tolerably favourable with all; but the trees having the stones placed at the roots have exceedingly outstripped the others. The dimensions of the trees in the first experiment—a rich, low, black, stony soil, drained—were, at the expiration of eight years, fifteen to seventeen inches in circumference, one foot from the ground. This may be considered (the tree being small when set out) as a growth of about two inches a year. The growth in the second experiment, for six years, was twelve to fourteen inches, in the holes in which the stones were put, one foot from the ground. Where no stones were put, nine inches was the growth. It will thus be perceived, that the vegetation was most powerful under circumstances by nature least favourable. If, then, thus much can be done to counteract such disadvantages, it surely offers much encouragement to our efforts, and leads us to hope, that not only in this, but in other objects, they may be beneficially extended."

ORCHARD PRUNING.

It has been remarked, that the management of orchards is capable of being reduced to a system, under a few general heads, connected in the principle of making all trees in an orchard healthy, round, large and beautiful. There is no part of this management, perhaps, so important, and which requires more skill, and at the same time is so little understood, as the process of orchard pruning. The necessity of commencing, and annually repeating this operation in the nursery, has already been inculcated. When this discipline is properly put in practice, at that early period of growth, there will be less employment for the pruning knife at all future periods; it will nevertheless be found indispensably necessary to retrench redundant or superfluous shoots and branches in every successive year of their existence. "To the neglect of pruning fruit trees in due season," says Mr. *Yates*, "and the unskilful manner of performing it, may, in a great measure, be ascribed the bad and unfruitful state of some of the orchards in America. This inattention and mismanagement, and, especially, the not amputating dead limbs, and extirpating all infected parts of fruit trees, subjects them to disease, mortification, and death. An unpruned tree, left in a natural state, will bear fruit sooner than one that is pruned; for by pruning, the parts below the lopped or amputated branches become viviparous, and produce new *leaf* buds, which require several years before they will acquire sufficient maturity to generate *flower* buds, to produce an oviparous progeny; but unpruned trees grow and look irregular and unsightly; nor is their fruit to be compared to that of trees properly pruned and managed, in order to afford them a more equal advantage of the sun and air, by means whereof they will produce fruit better in size and quality."

The two great practical errours which have hitherto prevailed, and by which fruit trees have suffered irreparable injury, are, 1. The season of the year; and 2. The awkward and unskilful manner in which the operation has been performed. In general, the months of February and March have been considered as the preferable season for pruning, and not unfrequently the executioner is sent into the tree with his exterminating axe, where he commences an almost indiscriminate slaughter, leaving long projecting stumps, and disregarding equally the form and beauty of the tree, and the particular branches and spurs upon which the future crop principally depend. In March, the sap is retained in the roots, and the bark adheres closely to the wood; consequently, the wounds occasioned by the amputation of branches being exposed to the cold, penetrating winds and frosts, before the circulation of the sap, become dry, rotten, and cankered, and often crack open nearly to the main trunk. In old orchards, particularly, if limbs of any considerable size are lopped off, several inches from the trunk, before the sap is in active motion, the fresh bark round the wood becomes dry, large cavities are formed, which rapidly extend towards the trunk and heart, and the tree is soon deprived of its health and vigour. This unskilful procedure has so long been in practice, that it need excite no surprise, that a large proportion of our old orchards exhibit a mortifying, disgusting spectacle of dead branches, rotten stumps and hollow trunks, verging to total ruin. The greatest cause for surprise is that our intelligent farmers should suffer their valuable land, year after year, to be encumbered with such worthless lumber, fit only for the resort of vermin and insects; for it may be observed, that the more delicate feathered tribe disdain to occupy such detestable ruins for the purpose of rearing their brood. The long life of different orchards, soil and situation being equal, will depend, it is said, more on judicious pruning than on any other circumstance. Young trees differ much in their natural form and tendency, and the mode of pruning should vary accordingly. The peculiarity of growth, which characterizes each kind, is easily discovered when from four to five or six years old; and this is the most favourable period to complete what was begun in the nursery, for the purpose of correcting any natural defects in their form, and giving the proper direction in their future growth. The most proper season for pruning fruit trees, unquestionably is when the sap-juice is in active motion toward the extreme branches. In our New England climate, we have the clearest indications that the sap commences its circulation about the 10th of April. From this period to about the last of May, whether the buds are just opening, or the blossoms fully expanded, the pruning should be accomplished. It would, for certain reasons, however, seem advisable not to delay the operation after the first week in May, as the branches are then so charged with a full flow of sap, that the bark would be apt to peel, whereby unseemly wounds might be left, and canker induced: and besides, the undergrowth, whether grass or grain, might be so far advanced as to suffer injury by being trampled upon. For the purpose of performing this operation in a proper manner, a saw, chisel, and pruning knife, must be provided. It will next be requisite to have at hand some suitable composition to apply to the wounded parts, to defend against wet, cold air, or the scorching sun. It is immaterial whether we employ Forsyth's composition, or the clay as prepared for grafting, or an ointment composed of rosin, beeswax, and turpentine. Some prefer a composition of tar with a little beeswax, simmered together, to which some red ochre is added. This composition, or the abovementioned ointment, should be of a proper consistence to be applied to the wound with a knife or smooth stick, and they will adhere, and last two years without requiring to be renewed. With respect to the proper method of pruning, no particular unexceptionable rules can be prescribed; much must depend on experience and attentive observation. It is among the most important rules, however, not to amputate a large limb, close to the main trunk of a full grown tree, nor indeed a branch, which is too large at the place of excision to heal or to close over again, as you may give the tree its death-wound, by opening an avenue to the air and water, which induce rottenness, and, in course of time, the limb or trunk becomes hollow, frequently to the roots. In pruning, some regard must be had to soil and climate. If the situation be wet and cold, trees should be pruned more open for the benefit of sun and air, which are less essential in a dry sandy soil, where the fruit ripens better. Winter fruit trees should have their branches left wider asunder than summer fruit, as they require more warmth of the sun than the latter. The general shape of old trees should be left substantially the same, that the ascending juices may continue, as much as possible, in their established channels. Care must be taken not to cut away too many large limbs at a time, lest too large a portion of the sap should remain inactive, and thus occasion mischief. Always prune at a fork, and remove the lower branch, that the wound may be on the lower side rather than the upper side. All large limbs should be cut first at some distance from the place where they are to be pruned, as the weight may peel the bark, and leave a bad wound; and in order to prevent the same accident, the bark, on the under side, should be cut through before the limb is amputated. In every instance, after sawing off the branch, let the bark and edges of the stump be pared close and smooth with a sharp knife, and immediatly apply the composition so as to cover the whole surface of the wound. This is more especially necessary when the operation is performed in a cold season, before the sap is in circulation. By this procedure the new growth or healing process immediately commences, and instead of an unseemly rotten cavity, as in the old method, the wound will, during the season, if not large, be completely healed over, and the tree remain sound and flourishing. It is to be observed, that the fruit of the apple tree is produced on short, thick, side, or terminal shoots or spurs, from one to two or three inches long. These spurs naturally proceed from branches two, three, or four years old, and as these branches increase in length, the fruit spurs increase in number, and they continue to be fruitful for several years. Mr. Forsyth always leaves the branches of three different years on the tree, and thus keeps them in a constant bearing state; whereas, if left to nature, they would only produce a crop of fruit once in two or three years. All old ragged spurs, and useless snags and twigs, should be taken off close to the trunk; no dead limbs should be suffered to remain, nor even thrifty branches that have an irregular tendency, running inwards, and rubbing against each other. Such branches as intersect or cross each other, and thus occasion confusion in the crown of the tree, ought to be removed, and all others cleared of suckers to their very extremities; and indeed it will be necessary to prune out a good proportion of the top branches, in order to spread open the crown of the tree, to admit a free circulation of air and the rays of the sun, which are essentially necessary to mature and ripen the fruit. Those superfluous lateral branches which grow irregularly, and all dead wood, should be annually extirpated, to give the proper bearing branches sufficient room without injuring the beauty of the tree, leaving the fruit branches as nearly equidistant as possible. Such branches as have received any material injury ought to be removed. If the tree in its first or second sap tend to shoot abundance of wood, the young shoots should be pinched off while tender, but never cut while the sap is flowing, because the tree, by cutting at that time, is apt to run into wood, and the blossom buds liable to be injured by being deprived of sap. Never suffer a sucker to remain near the root, from one year to another, nor by any means upon the body or trunk, which is not intended to be permanent. Those vigorous young shoots, which often spring from old arms, near the trunk, and incline to grow up into the head, must be annually extirpated, lest they fill the tree with too much wood. A sufficient portion of fertile wood should be left in every part, but leave no useless branches, to exhaust the nutritive powers, and thereby accelerate the decay of the tree. Mr. Marshall, in his Rural Economy, observes, that "a redundancy of wood is the cause of numerous evils. The roots, or rather the pasturage which supports them, is exhausted unprofitably; the bearing wood robbed of part of its sustenance, and the natural life of the tree unnecessarily shortened; while the superfluous wood, which is the cause of this mischief, places the tree in perpetual danger, by giving the winds additional power over it, and is injurious to the bearing wood, by retaining the damps, and preventing a due circulation of air. The underhanging boughs weigh down, especially when loaded with leaves, the fruit bearing branches they are preying upon, giving them a drooping habit, or at least preventing their taking, as they ought and otherwise would, an ascending direction; while those which grow within the head are equally injurious in crossing and chafing the profitable branches. The outer surface only is able to mature fruit properly. Every inward and every underling branch ought therefore to be removed. It is no uncommon sight to see two or three tiers of boughs pressing down hard, one upon another, with their twigs so intimately interwoven, that, even when their leaves are off, a small bird can scarcely creep in among them. Trees thus neglected acquire, through a want of ventilation and exercise, a runty, stinted habit, and the fruit they bear becomes of a rude, inferiour quality. By some, we are advised never to suffer apple trees to begin to head short of six or eight feet, for the convenience of passing under them in ploughing, and to admit the warming and fertilizing influence of the sun and air to the undergrowth. But the horizontal and drooping branches are always the most productive of fruit, and this is less liable to be shaken off by the wind, and is more conveniently gathered by hand. Those who cultivate an orchard for the benefit of the fruit, must make the undergrowth a secondary consideration.

HEADING DOWN OLD DECAYED APPLE TREES.

According to Mr. Forsyth, when the tops of the branches of apple trees begin to die from old age or other cause, they ought immediately to be regenerated by giving them a new top. This is done by cutting off a few feet of their extremities over the whole tree, so as to leave it in a proper form. If the trunk is yet tolerably sound, the new branches will grow thriftily, and bear luxuriantly; and if you wish to vary your fruit, the sprouts, after one year's growth, and most frequently the same year, will be fit for inoculating, which succeeds equally well in the old as in the young trees. In heading down old decayed apple trees for the sake of symmetry, it will be necessary to cut at the forked branches as near as can be to the upper side of the fork, cutting them in a sloping manner to carry off the wet, and at the same time rounding the edges; and if any of the branches should have the canker, all the infected parts must be cut out. The composition must be immediately applied, to prevent the sun and air from injuring the naked inner bark. This operation should be performed in April or May, and, in the course of the summer, long thrifty shoots will be thrown out; these should not be shortened the first year, but in the following spring they may be cut to six or eight inches long, according to their strength. In the next spring, after the first branches are headed, the remaining old branches may be cut out, and these will soon fill the head of the tree with fine bearing wood. In three years, if properly managed, trees so headed will produce more and finer fruit than a maiden tree that has been planted upwards of twenty years. The method above detailed should be adopted with some caution, for it has been found, that trees will not survive the loss of all their branches, if lopped off in one season; it is preferable, therefore, to cut and graft them partially every season until the whole is accomplished.

DIRECTIONS

For making a composition for curing diseases, defects, and injuries in all kinds of fruit and forest trees, and the method of preparing the trees, and laying on the composition, by William Forsyth.

Take one bushel of fresh cow-dung, half a bushel of lime rubbish of old buildings, (that from the ceilings of rooms is preferable) half a bushel of wood-ashes, and a sixteenth part of a bushel of pit or river sand: the three last articles are to be sifted fine before they are mixed: then work them well together with a spade, and afterwards with a wooden beater, until the stuff is very smooth, like fine plaster used for the ceiling of rooms.—The composition being thus made, care must be taken to prepare the tree properly for its application, by cutting away all the dead, decayed, and injured parts, till you come to the fresh sound wood, leaving the surface of the wood very smooth, and rounding off the edges of the bark, with a draw-knife, or other instrument, perfectly smooth, which must be particularly attended to: then lay on the plaster about one eighth of an inch thick all over the part where the wood or bark has been so cut away, finishing off the edges as thin as possible: then take a quantity of dry powder of wood-ashes, mixed with a sixth part of the same quantity of the ashes of burnt bones: put it into a tin box, with holes in the top, and shake the powder on the surface of the plaster till the whole is covered over with it, letting it remain for half an hour to absorb the moisture; then apply more powder, rubbing it on gently with the hand, and repeating the application of the powder till the whole plaster becomes a dry and smooth surface. Where lime rubbish of old buildings cannot be easily got, take pounded chalk, or common lime, after having been slacked a month at least.

As the best way of using the composition is found by experience to be in a liquid form, it must therefore be reduced to the consistence of pretty thick paint, by mixing it up with a sufficient quantity of urine and soap suds, and laid on with a painter's brush. The powder of wood ashes and burnt bones is to be applied as before directed, patting it down with the hand.

When trees are become hollow, you must scoop out all the rotten, loose, and dead parts of the trunk till you come to the solid wood, leaving the surface smooth; then cover the hollow, and every part where the canker has been cut out, or branches lopped off, with the composition, and as the edges grow, take care not to let the new wood come in contact with the dead, part of which it may be sometimes necessary to leave; but cut out the old dead wood as the new advances, keeping a hollow between them, to allow the new wood room to extend itself, and thereby fill up the cavity, which it will do in time, so as to make, as it were, a new tree. If the cavity be large, you may cut away as much at one operation as will be sufficient for three years. But in this you are to be guided by the size of the wood and other circumstances. When the new wood, advancing from both sides of the wound, has almost met, cut off the bark from both the edges, that the solid wood may join, which, if properly managed, it will do, leaving only a slight seam in the bark. If the tree be very much decayed, do not cut away all the dead wood at once, which would weaken the tree too much and endanger its being blown down by the wind. It will, therefore, be necessary to leave part of the dead wood at first to strengthen the tree, and to cut it out by degrees as the new wood is formed. If there be any canker or gum oozing, the infected parts must be pared off or cut with a proper instrument. When the stem is very much decayed and hollow, it will be necessary to open the ground and examine the roots; then proceed as directed for hollow peach trees.

By using the composition in a liquid state, more than three fourths of the time and labour is saved; and I find it is not so liable to be thrown off as the lips grow, as when laid on in the consistence of plaster: it adheres firmly to the naked part of the wound, and yet easily gives way as the new wood and bark advance.

In his introduction to the American edition of Forsyth, Mr. W. Cobbett says, "During the last summer, (1801,) I went with a party of friends to be an eye-witness of the effects (of which I had heard such wonders related) of this gentleman's mode of cultivating and curing trees; and though my mind had received a strong prepossession in its favour, what I saw very far surpassed my expectations. Mr. Forsyth, whose book was not then published, did us the favour to show us the manuscript of it, and also the drawings for the plates, which are now to be found at the end of the work. After having read those parts of the manuscript which more immediately referred to the drawings, we went into the gardens, and there saw every tree which the drawings were intended to represent, and of which we found them to be a most exact representation. We examined these trees from the ground to the topmost branches; we counted the joints in the wood; ascertained the time and extent of its growth; and, in short, verified every fact that the book related. To raise fine, flourishing wood from an old, cankered, gummy, decayed stem; to raise as much wood on that stem in three years as could have been raised on the finest young tree in twelve years; to take the rotten wood from the trunk; to replace it with sound wood, actually to fill up the hollow, and of a mere shell to make a full, round, and solid trunk; all this seems incredible, but of all this we saw indubitable proof." In the work just referred to, we have the valuable observations of Peter W. Yates, esquire, of Albany, respecting Forsyth's treatise, as follow: "Mr. Forsyth's treatise is well calculated to rouse the care and attention of gentlemen on this side the Atlantick, to the cultivation and management of fruit trees. The perusal of his pamphlet, London edition, 1791, afforded him both satisfaction and astonishment. To renovate diseased trees fast hastening to decay, and to increase the quantity and meliorate the quality of the fruit, in the way prescribed by him, seemed almost incredible." But Mr. Y. was induced to make the experiment. Accordingly in May, 1796, he adopted the mode of process prescribed by Forsyth, on a young bearing (bonecretien) pear tree, the bark of which, as well as the alburnum or sapwood, and the heart wood, were dead from the ground upwards about five feet. He cut away all the dead part, leaving nothing but the bark on the opposite side, and applied the composition. The effects were soon visible: the external part of the wound, which composed about one third part of the trunk, was in a few days surrounded by a callus or lip, which continued to increase until the sap-flow was obstructed and stagnated by the next autumnal frost; but by the subsequent annual flow of the juices, the callus increased so as to fill the wounded part with new wood. The old and new wood united, and is covered with new bark. In many other instances, he made similar experiments on various kinds of fruit trees with satisfactory success. He is, therefore, of opinion, that Forsyth's remedy affords a radical cure for diseases, defects, and injuries in all kinds of fruit trees, and that in pruning, especially where large amputations are made, the composition ought always to be applied, as it prevents the exuding of the vegetable juices through the wounded parts, aids and precipitates the healing of the wounds, promotes the vigour and health of the trees, and adds to the size and flavour of the fruit.

The composition of Mr. Forsyth does not, at this day, sustain such high reputation as formerly. It is not supposed to possess great efficacy as a medicament when applied to diseased trees; and for the purpose of defence against wet and heat, it is not perhaps preferable to an ointment composed of rosin, beeswax, and turpentine. It is probable, that a composition consisting of clay, tempered with horse dung and urine, would be found of equal utility. We are not unacquainted with instances of surgeons acquiring great celebrity by the application of certain medicaments to old ulcers, when in verity the cure was effected by the efforts of nature.

MEANS OF PRESERVING THE HEALTH AND VIGOUR OF FRUIT TREES.

To promote the health and vigour of fruit trees, Mr. Forsyth recommends the following method, and it has been practised in our country with the most decided advantage. Take any quantity of urine and soap suds, and add fresh cow dung, and a little slacked lime, sufficient to bring it to the consistence of very thick white-wash or paint. After having removed all cankery parts, and scraped off the rough bark or moss from the trees, this mixture is to be applied to the stems and branches with a brush, in the same manner as the ceiling or walls of a room are white-washed. This, if done in March or April annually, will effectually destroy the eggs of insects, and prevent moss from growing on the trunk and branches; it will also contribute to the nourishment of the tree, and render the bark healthy, so that in the course of the first or second summer, a fine new bark of a fresh and green appearance, takes the place of the old one. If this application be repeated in autumn, after the fall of the leaves, it will have a salutary tendency in destroying the eggs of numerous insects that hatch in autumn and winter. For the same purpose of Forsyth's mixture, white-washing with lime has been practised, and found very beneficial in producing similar good effects. The application of strong, undiluted soft soap is employed by Mr. Ogden, of Flushing, Long Island. The soap applied by means of a brush, destroys the moss and softens the bark, and, when washed off by rain, acts as a manure to the roots. When Mr. O. began this process, his trees were covered with moss and old scaly bark, and bore bad crops; but in two years all the old bark dropped off, and the trunks became as smooth as a young poplar. The soaping may be done at any season, and repeated, if necessary.

A correspondent of the Caledonian horticultural society, (Scotland,) recommends *clay paint* for the destruction of insects, and the mildew on fruit trees. The instructions are, that you take a quantity of the most tenacious brown clay that can be obtained; diffuse among it as much soft water as will bring it to the consistence of soft cream or paint; pass it through a fine sieve, so that it may be made perfectly smooth and unctuous, and freed from any gritty particles. With a painter's brush dipped in the clay paint, go carefully over the whole tree, not excepting the young shoots. This layer, when it becomes dry, forms a hard crust, which, envelop-ing the insects closely, completely destroys them without doing the smallest injury either to the bark or buds.

Whatever promotes a free circulation of the sap, as cleaning the bark from scales, and scraping it to make it tender and yielding; and whatever helps to perfect the maturation of the sap in the leaves of the tree, by giving them a full exposure to the sun and air, as by cutting out the central branches when the head is too bushy, and giving it an expanded form, promotes the growth, general health, and productiveness of the tree.

In case the trees are observed to be *hide-bound*, as it is termed, when the bark cracks by reason of the stem growing faster than the bark, it will be necessary to pass the point of a knife perpendicularly through the outer bark only, from the ground as high as the branches, taking care not to injure the inner bark. It not unfrequently happens, that from the intense rays of the sun of summer, striking nearly at right angles, the sap on the south side of the trees becomes so coagulated as to occasion the death of the bark; canker ensues, and finally, the tree itself is entirely destroyed. As a remedy for this serious evil, a coat of the abovementioned clay paint, or Forsyth's composition, it is presumed will prove effectual.

MEANS OF PREVENTING THE FLOWERS AND FRUIT FALLING OFF, AND OF RETARDING THEIR OPENING.

The means proposed to retard the opening of flowers, consist in making, in the autumn, a ligature on the stems of the young trees; that compression slackens the motion of the sap's rising, and the tree blossoms the later. Fruits are also liable to fall off as well as flowers. We see trees, which, after having had a great abundance of flowers, are covered with young fruit, that promises the most plentiful crop; but it sometimes happens that they almost all drop off. This accident is too frequent with apple and pear trees. The way to remedy this inconvenience, is, to sprinkle the root or foot of the trees, when they are in blossom, with five or six buckets of water; and to preserve the humidity, the bottom must be covered with straw, which prevents too hasty an evaporation of the water: by these means the flowers and buds are preserved from falling off.

DISEASES AND OTHER INCIDENTS WHICH RENDER FRUIT TREES UNPRODUCTIVE.

All the maxims relative to fruit trees, it is said, centre in the word *health.* The great object of the fruit farmer, says Marshall, is to produce a crop every year; and nothing is more likely to obtain it, than keeping the trees in perfect health, and endeavouring to prevent their bearing beyond their strength, in a general fruit year. The enemies of fruit trees, says the author, are a redundancy of wood, moss, spring frosts, blights, insects, an excess of fruit, old age. To these should be added canker. Some of them are beyond human reach, but most of them are within the control of art. The term *blight* is of vague signification. Black blighting winds are talked of every where, but no definite idea is any where affixed to the expression. That corn and fruit become unproductive without any visible cause, and that fruit trees are liable to be infected with insects, are certainly facts. But whether insects be the cause or the effect of blights, does not appear to be yet settled. With respect to blights, all the assistance which art can render, is to keep the trees in a state of healthfulness, and prevent, as much as possible, an excess of fruit. As old age cannot be prevented, we have only to consider how the productiveness of trees may be protracted. I have seen, says he, healthy bearing apple trees which now wear their second top. The first tops being worn out, were cut off, and the stumps saw-grafted. Sometimes we see trees so far gone in decay, that their productiveness no longer repays their incumbrance of the soil. How injudicious, in such case, is the conduct of the proprietor, who permits such trees to remain year after year, imbibing and wasting the substance of his soil! *Moss* is chiefly, perhaps, owing to the nature of the soil, and cannot be altogether prevented; but it may in most cases, be checked, and its evil effects in a great measure avoided. "I have seen several orchards," observes our author, "in which the trees were almost entirely subdued by this vegetable vermin. Some of the trees with, perhaps, only one bough left alive, and others entirely killed, and yet suffered to remain, an incumbrance to the ground, and a disgrace to the country." It would appear, by the above observations of Mr. M., that the same culpable neglect in the management of fruit trees prevails in England as in our own country.

Blight, says another writer, means, the effects of cold winds, or hoar-frosts on the foliage and blossoms of trees. Easterly winds, accompanied with fogs, often produce blights; the buds are nipped, and the tender vessels burst, innumerable insects soon appear, and the branches become withered. "By accident," says Dr. Mease, "Mr. Cooper of New Jersey, discovered some years since, that a tree upon which a number of iron hoops and other articles of iron had been hung, remained free from blight, while all the rest suffered severely. Since that year he has constantly encircled two or three branches of every tree with an iron hoop, and with uniform success. As a proof, he pointed out one tree with a withered limb near the top, and observed, that he had neglected to defend it last year. Philosophers may speculate as to the theory of the operation of the iron, and cause of the blast, but practical men will be contented with a knowledge of the important fact, which comes from a man of judgment and of an observing disposition, who has again and again satisfied himself that no deception or accidental circumstance occurred, by reference to which the preservation of his hooped trees could be accounted for."

CANKER.

Apple trees are very liable to be affected with the canker. This disease occasions the bark to grow rough and scabby, and turns the wood affected to a rusty brown colour; and if no remedy be applied, will in time kill the tree. It is by some described as a sort of gangrene, which usually begins at the extremities of the branches, and proceeds towards the trunk, killing the tree in two or three years. Peter Yates, esquire, of Albany, observes, that his fruit trees became affected with the canker, generally appearing on the southwest side of the body or trunk of the tree. The bark of the infected part at first appeared dark, and at length rough, wrinkled, cracked, and dead. The infection annually increased; it communicated to the alburnum or sap wood; the circulation of the sap-juice was obstructed; it gradually diminished; it stagnated; and the tree perished. The general opinion respecting the cause of this disease is, that it proceeds chiefly from the nature of the soil. Mr. Forsyth, however, proves from experience, that it originates from the following circumstances, namely: injudicious pruning; leaving the foot stalks of fruit on trees after it has been gathered; bruises, arising from the use of ladders in collecting fruit; and dead shoots, left on trees during the summer. But, says Mr. Yates, "it seems extraordinary, that the fruit trees in this climate are almost invariably affected on *the southwest side* of the trunk or body of the trees. There it generally commences, and continues to increase annually, until the infection is communicated to the limbs. If I might be permitted to hazard an opinion, I would account for it as follows: That it is caused by the hot rays of the meridian sun, which in that direction is most powerful, and strikes the tree nearly at right angles. The south side of trees grows faster, for there the vegetation is more rapid, than the north: this may be seen by the concentrick rings of a tree when cut or sawed into logs. Fruit trees generally incline to the northeast, which exposes their trunks to the influence of that luminary in the spring, when the sap-juice is subject to alternate freezing and thawing. The motion of the sap (which ascends in the vernal months in all deciduous trees) is accelerated by the hot rays of the sun at southwest. It is retarded and stagnated in the cool of the nights, whereby the irritability of the vegetable vessels is decreased for want of a sufficient stimulus of heat; and by this alternate thawing and freezing of the sap-juice, and particularly on the southwest side of the tree, where the sun's rays are most powerful, the vegetation is at last destroyed, and mortification ensues." It frequently happens, that scions for grafting are taken from infected trees; and the young trees produced in this way are, as might be expected, peculiarly obnoxious to the disease. From whatever cause the canker may arise, Mr. Forsyth directs all the diseased parts to be cut out with a sharp instrument; and if the inner white bark be affected, this also must be cut away, until no appearance of infection remains. The composition must then be applied. This method Mr. Yates has found by experience to prove effectual. (See directions for making and laying on the composition, page 69.) Mr. Cooper, of New Jersey, has found the best remedy for canker to be a composition of rosin, tallow, and beeswax, of a proper consistence to stick, after taking off all the dead parts.

MOSS, AND SCALY BARK, AND DECORTICATION.

Fruit trees, in all soils, and in all situations, are liable to have their trunks covered with moss, and their bark rough and scaly. Besides the unseemly appearance, fruit trees suffer much injury by these causes, if suffered to continue without a remedy. The moss is easily removed by scraping with the back of a knife, and rubbing with a cloth, after a rain, or in damp weather; and the scaly bark may with equal facility be scraped off with a hoe or knife. This operation should be performed every spring, and immediately after, the trunks and larger branches should receive a proper coat of some of the compositions already mentioned. Either the washing with the liquids, or the application of undiluted soap, (see page 74) will effectually remove any remains of moss, and, if occasionally repeated, the health and vigour of the trees will be restored, and in two years the bark will appear fresh and smooth. In some diseased condition of the bark of apple trees, the experiment of disbarking the whole trunk from the ground to the branches, has been successfully practised. Dr. S. L. Mitchell, of New York, in the summer of 1799, deprived the whole body of one of his apple trees of the bark, without injury to its leaves or fruit; and in two months an entire new coat of bark was found surrounding the wood on every side. Dr. M., however, observes, that though he has several times been witness of the harmlessness of the practice, it looked to him still like a very violent and hazardous remedy. This sort of decortication is by no means a novelty. Many ancient writers have observed, that in cases where the outer bark has become rough and full of chinks, so that small insects deposit their eggs and produce their larvæ below this bark, it is a good practice entirely to remove it. Of late years, Mr. Knight practised decortication on some old fruit trees, particularly redstreak apples, and found the new growth thus produced quite surprising, so that the growth of some trees, deprived of their bark in 1801, exceeded in the summer of 1802 the increase of the five preceding years taken together. This method has been adopted in various parts of New England, sometimes with complete success, and again, the result has been the entire destruction of the trees. This failure is attributed, by an ingenious writer in the Massachusetts Agricultural Repository, to a want of skill in the operator; observing, that he has seen a young apple tree in the town of Hallowell, which, on account of some defect, was stripped of its bark about ten years prior to his writing, the longest day of June, and which still lives and bears fruit. Much of its success, it is said, depends on the proper time and manner of performing the operation. It should be done while the tree is in the full flow of sap, about the middle of June, or on the longest day of that month, and the bark should be peeled off entirely smooth to the alburnum. It is scarcely probable, however, that our farmers will be disposed to resort to this troublesome and uncertain expedient, when the milder methods above described will answer every purpose.

Fruit trees are liable to have their bark torn off by field mice, sheep, and various accidents; to remedy which, take some strips of bark from a tree of the same species, about two or three inches in width, and place four or five of them, according to the size of the wound, perpendicularly round the naked part. The edges of the torn bark being cut smooth, the sound bark should be a little raised, and the slips inserted beneath it to promote the circulation of the sap. The slips are next to be bound quite tight with rope-yarn, and the composition of Forsyth, or a mixture of loam and cow-dung, must be applied, and this covered with a coarse cloth. This method of treatment has been successfully practised; the slips adhere closely, and, being full of sap, soon become firm and smooth. Instead of bark slips, small twigs may be successfully applied in a similar manner.

SPRING FROSTS, AND OTHER CAUSES AFFECTING THE BLOSSOMS.

Every cultivator of fruit trees has experienced more or less disappointment in his expected crop of apple, pear, and other fruit trees, after having exhibited the fairest prospect in the vernal season. While in full blossom, and the fruit just beginning to form, the petals are cast off, like the dead leaves in autumn. This incident is said to be occasioned by warm and drying winds, by which the vigour of the trees is diminished. In one instance it appears that a remedy has been successfully applied, and the loss and inconvenience prevented. J. Sowerby, esquire, in the spring of 1815, observed that the drying winds generally succeeded the blossoming of his fruit trees; the whole used to be blown off about the time of the setting of the young fruit. Deeming it probable that a good dose of water at the roots would strengthen the tree, and save the fruit, the experiment was tried, and the good effect was perceived in twenty-four hours; the young fruit then resisted the attack of the winds, and a large crop was produced. Not only were the trees enabled to produce their fruit in abundance, but also to increase them in size to nearly double. The blossoms of apple trees are liable to be injured or destroyed by various other causes; as severe cold, a hazy state of the atmosphere, frosts, and insects of various kinds; and Mr. Knight has remarked, that they also fail frequently from want of impregnation when the weather is unusually hot and dry, or when cold winds prevail, as he often observed the farina to wither and die on the antheræ in such seasons.

Spring frosts are an enemy, against which perhaps it is most difficult to guard orchard trees. "Dry frosts," says Marshall, "are observed to have no other effects than keeping the blossoms back; consequently, are frequently serviceable to fruit trees. But wet frosts, namely, frosts after a rain, or a foggy air, and before the trees have had time to dry, are very injurious even to the buds. An instance is mentioned, in which a flying, hazy shower in the evening was succeeded by a smart frost; that side of the trees, against which the haze drove, was entirely cut off, while the opposite side, which had escaped the moisture, likewise escaped the effect of the frost. Much, however, may depend on the strength of the blossoms. When the buds form, and the blossoms break forth with unusual vigour, they are enabled by their own strength to set common enemies at defiance. But, on the contrary, when the blossoms sicken in the bud, and those which open are weak and languid, scarcely an apple will be produced. The assistance, therefore, required from art, in this case, is by keeping the trees in a healthy, vigorous state, to enable them to throw out a strength of bud and blossom; and by keeping them thin of wood, to give them an opportunity of drying quickly before the frost sets in." Apple blossoms are, in some seasons, injured by the devastations of an uncommon number of insects produced from a species of black flies, which deposit their eggs in the bud at its first opening, and which, by feeding on the heart of the bud, soon occasion it to contract and drop. To remedy this fatal effect, we are advised to collect heaps of long dung, wet straw, weeds, &c., to dispose them in different parts of the orchard, and set fire to the heaps in that quarter from which the wind blows, so that the smoke may thoroughly fumigate all the trees. Thus the insects, which are supposed to be brought by the wind, will be prevented from depositing their eggs.

CANKER WORM.

Of all the numerous tribes of insects which infest fruit trees, and disappoint the hopes of the cultivator, the *canker worm*, during the years of its prevalence, is the most to be dreaded. This destructive insect has, therefore, baffled the efforts of man, and, in despite of all means of prevention as yet devised, commits its depredations, and deprives whole orchards of foliage and fruit. The miller, or moth, rises from the earth in the spring, conceals itself during the day in holes and crevices under the loose bark of apple trees, and may be easily found by searching. The male has wings, but the female appears to have none; they are enabled, however, to ascend the trunk of the tree, and crawl towards the extremities of the twigs, where they deposit their eggs, and as soon as the leaves unfold and sprout forth, the worm bursts from the egg and commences its ravages. The worms soon spin for themselves long threads, similar to those of spiders, by which they are suspended in the air, and wafted by the wind from tree to tree, and from one adjoining orchard to another, preying voraciously upon the foliage, and giving the trees the appearance of being burnt. Professor Peck, of Cambridge, has favoured the publick with the most satisfactory history of this insect, which has yet appeared. According to him, the worms descend by the trunks of the trees in June, and immure themselves in the earth near the trunks, and rarely, if ever, more than three to four feet distant; in grass land from one to four inches deep, and in ploughed land not more than to the depth of seven or eight inches. He has also ascertained that a part of the canker moths rise in the autumn and deposit their eggs. They are such as were an inch or two below the surface; those which lie deeper are not affected by the transient changes of the atmosphere in November, and do not rise till the spring. The chrysalis state comes in twenty-four hours after the larvæ has penetrated the earth, and it appears that the insects are soon perfect, since a course of warm weather has been found to raise some of them from the earth in November. Those which rise in November are not very numerous, compared with those which rise in the spring, but being very prolifick, are exceedingly injurious, if no means are taken to prevent their ascending the trees; as the winter's frost does not kill the eggs. The warmth of the season at the time of the descent into the soil is favourable to the perfect development of the insect in the chrysalis, particularly those which are nearest the surface, while those at the depth of six or seven inches are longer in coming to maturity. The first are perfect in September, and require only to be excited to burst from their confinement; but they cannot be excited until they have passed through a degree of cold sufficient to make them sensible of the mild temperature of the atmosphere which occurs in November. The excitability of such as lie deeper, and are not accessible by cold till a later period of the season, is not so soon accumulated; nor are they sensible of slight changes of temperature, which affect only the surface; they, therefore, do not leave the earth till the spring, when the warmth of the air is longer continued, and penetrates to the depth at which they lie. To prevent the dreadful ravages of the canker worm, the great object is to keep the female from ascending the trees. For this purpose various methods have been proposed. A writer in Carey's American Museum, August, 1792, says, "Canker worms never destroy apple trees which stand on a stiff clay, or in low ground, where water stands long in the spring. The reason for this is obvious. The canker worm, about the 10th of June, descends into the earth, there to lie till the next spring, when the miller rises and ascends the trees. This worm is not strong, nor furnished with the necessary implements for digging into a hard stiff clay; of course it cannot bury itself in clay, and is not fond of gravel. The writer therefore proposes to lay a covering of stiff clay round trees which stand on sand or other light earth. This covering or layer may be thrown upon the top of the natural soil, which may be removed to the depth of a few inches. If the clay be laid on in summer, after the descent of the worm, it may prevent the miller from rising in the spring; if when the worm is upon the tree, it may prevent its finding a lodging; but as in the latter case, the worm might travel some distance beyond the limits of the layer, it might be better to form the layer round the tree after the descent of the worm in June."

According to Dr. Dean's New England Farmer, it is now about eighty years since New England was first visited by these destructive insects. He observes, if any person could invent some easy, cheap, and effectual method of subduing them, he would merit the thanks of the publick, and more especially of every owner of an orchard. Several methods have been tried with some degree of success. 1. Tarring. A strip of canvass is put round the body of the tree, before the ground is open in the spring, and well smeared with tar. The females, in attempting to pass over it, stick fast and perish. But unless the tarring be renewed very frequently, it will become hard, and permit the insects to pass safely over it. And renewing the tar in season is too apt to be neglected, through hurry of business and forgetfulness. The insects are so amazingly prolifick, that if ever so few of them get up, a tree is ruined, at least for the ensuing season. 2. The pasturing of swine in an orchard Dr. Dean supposes to be an excellent method, where it can conveniently be done. With their snouts and their feet they will destroy many of the insects before they come out of the ground; and he has never known any orchard constantly used as a hog-pasture, wholly destroyed, or even made wholly unfruitful by worms. But this method cannot always be taken; and if it could, he does not suppose it would be quite effectual. He considers tarring as the preferable antidote, and gives the following directions for applying the article in the most effectual manner.

In the first place, it is necessary to begin the operation very early in the year. Not observing this caution has occasioned the want of success which many have complained of; for it is certain that the bugs will begin to pass up as soon as the ground is so much thawed, that they can extricate themselves; which is, in some years, as early as February. Therefore, to make sure work, it is best to begin as soon as the ground is bare of snow in that month, that the first thawing of the ground may not happen before the trees are prepared; for beginning after ever so few of the insects have gone up, the labour will all be lost. Another thing to be observed is, to fill the crevices of the bark with clay mortar before the strip of linen or canvass is put on, that the insects may not find any passages for them under it. Having put on the strip, which should be at least three inches wide, drawn it close, and strongly fastened the ends together, a thumb-rope of tow should be tied round the tree, close to the lower edge of the strip. The design of doing this is, that the tar may not drip, nor run down on the bark of the tree, which would injure it. When all the trees of an orchard are thus prepared, let the strips be plentifully smeared with cold tar, put on with a brush. It should be renewed once a day without fail. The best time is soon after sun-set, because the insects are wont to pass up in the evening, and the tar will not harden so much in the night as in the day, because of the dampness of the air. The daily task must be renewed, and performed with the greatest care, till the latter end of May, or till the time when the hatching of the worms is commonly over, which will be earlier or later, according to the difference of climate.

Another mode of tarring, and which bids fair to be preferred to the foregoing, is as follows: Take two pretty wide pieces of board; plane them; make semicircular notches in each, fitting them to the stem or body of the tree; and fasten them together securely at the ends, so that the most violent winds and storms may not displace nor stir them. The crevices betwixt the boards and the tree may be easily stopped with rags or tow: then smear the under sides of the boards with tar. The tar being defended from the direct rays of the sun, will hold its tenacity the longer, and, therefore, will not need to be frequently renewed; and the trees may be secured more in this way from the dripping of the tar, as a margin of two or three inches, next to the tree, may be left unsmeared.

“The remedy of tarring,” says professor Peck, “was probably first suggested by the structure of the female insect, which, happily for man, has no wings. If this remedy were diligently and universally used, it would very likely rid us of this pest; it must, indeed, be granted, at a considerable expense. But the negligence of many will counteract the vigilance of a few, whatever remedy may be proposed or discovered. Mr. P. recommends, 1st. Turning up the ground carefully in October, as far as the branches of a tree extend, to half a spade's depth or five inches, so as completely to invert the surface. A great number of chrysalids would thus be exposed to the air and sun, and of course be destroyed. 2dly. Breaking the clods and smoothing the surface with a rake, and passing a heavy roller over it, so as to make it very hard, and without cracks. By these two operations every vestige of their downward path would be completely obliterated, and if any remained undisturbed below the stratum of earth which has been turned up, they must remain there, as it is utterly impossible for them to force their way in the moth or miller state, through such an obstruction as this layer of earth would oppose to them. In grass grounds the sods should be turned with the grass side down, and placed side by side, so as to be rolled; the earth from which they were taken should be loosed and rolled also. It is probable, that with this treatment no moths would rise in the fall. The winter's frosts would heave and crack the smooth surface, but it might be smoothed and hardened by the roller or other means, in March, with much less trouble, time, and expense, than the long course of tarring requires. As lime, when slacked, is reduced to an impalpable powder, and is thus well adapted to close the least openings in the surface to which it may be washed by rains, Mr. P. is inclined to think its good effects are produced in this way as well as by its caustick quality."

Mr. Kenrick's method of destroying the Canker Worm.

John Kenrick, esquire, of Newton, proposes as follows: From any time in June, after the worms have entirely disappeared, until the 20th of October, let the whole of the soil surrounding the trees, to the extent at least of four feet from the trunk, and to a suitable depth, be dug up and carted away to a distance from any trees the canker worms are in the habit of feeding upon; and let there be returned an equal quantity of compost, or rich earth intermixed with manure. The earth taken from the trees, will make a substantial ingredient in compost. If a few straggling canker worms appear on any of the trees the spring following, let such trees be marked, that the operation may be repeated the succeeding summer. The process proposed will not only accelerate the growth, and increase the fruitfulness of the trees, but will prove a considerable guard to them against the depredations of moles in the winter following; advantages which will abundantly outweigh the whole expense. But the pre-eminent advantage obtained, will be to have captured those destructive invaders, broken up and completely destroyed their encampments. Annual tarring, the only remedy in general use, instead of being beneficial to the trees, is allowed on all hands to be injurious. The seasons being variable, it requires considerable care and skill to know when to begin; if one day too late, some of the canker moths will have ascended the trees; if four days too early, so much labour and tar are lost. The same difficulty occurs in knowing when to cease tarring. The business must be attended to exactly in the right time, whether it rain or shine, and the operation repeated considerably more than twenty times in every season; and the average of various estimates of the annual expense of tarring each tree amounts to full ten cents. The method I have proposed, says Mr. K., appears to be perfectly adapted to the convenience of the practical farmer. He will avoid the trouble and expense of purchasing and applying tar, lime, or any other article; he can perform the operation when most at leisure, and with a certain prospect of ample reward for his labour, even if no damage were apprehended from the canker worm; and if the operation is performed in June, he can raise a crop of potatoes round the trees the first season. Hence it is obvious, that several very important advantages will be obtained in addition to the prime object; and the prudent farmer, who adopts this method, will have in view the most, if not the whole, of the following distinct objects:

1. Extermination of the canker worms.
2. Growth of the trees.
3. Fruitfulness of the trees.
4. Defence against the moles.
5. Several crops of potatoes.
6. Manufacture of compost.

Mr. Kenrick never having had any canker worms on his farm, could not personally prove the efficacy of the method proposed, by actual experiment. But it should be strongly recommended to the attention of cultivators of orchards, and it is hoped the publick may be made acquainted with the result of every trial.

John Lowell, esquire, (Mass. Agricul. Repos.) observes, that "the expense of tarring an orchard for several years, together with the injury sustained by the trees in the common mode of doing it, will be nearly equivalent to a total loss. The improvements, introduced by Mr. Parsons, and other cultivators, of surrounding the trees with canvass and rope-yarn, and stopping the descent of the tar by a bandage of coarse hemp, together with the mixture of the tar with oil, so as to keep it longer in a soft state, have very much diminished the inconvenience of the old practice. Still much remains to be desired. The process is imperfect, unless performed as faithfully in the fall as in the spring. If your neighbours are inattentive, you may be subjected to this labour for ten or twenty years, and your orchards will scarcely pay the continued and accumulated expense. Something further seems to be desirable; some mode more simple, less expensive, more effectual. In the southern states, I perceive, some persons are still ignorant of the natural history of this insect, and regret that it has not been examined and described by scientifick men. We have nothing left to be desired on this head. The description of the canker worm, by professor Peck, is very satisfactory, and only leaves us to regret that the same ingenuity could not have devised some speedy, simple mode of extirpating or checking them. Until some effectual mode is discovered, I think we should make constant experiments, and communicate fully the results, in the hope that if our trials shall not prove in every case successful, they may stimulate others to more happy ones.

"I had understood that Mr. Josiah Knapp, of Boston, was induced to try the effect of air-slacked lime. He put it round one of his trees in the spring of 1814, and I have been assured, not only by him, but by another respectable friend who examined it, that it was fully successful. The tree was in a small garden in Boston, surrounded with other trees, which were filled with the worms, and this one wholly escaped, except that a few appeared to have attacked its extremities, where they were interlocked with the other trees. I mentioned this fact to a Rhode Island gentleman, who informed me that, in that state, they had used the rubbish collected from the breaking of flax, and it had effectually prevented the rise of the insect. I resolved to make the experiment of lime on an extensive scale. As the insects rise in the fall, I determined to put the lime on in autumn. For this purpose I had the turf dug in around sixty apple trees, and the earth laid smooth. I then took three hogsheads of effete or air-slacked lime, and strewed it an inch thick round my trees, to the extent of about two or three feet from the roots, so that the whole diameter of the opening was from four to six feet. I tarred these trees as well as the others, and although I had worms or grubs on most that were not limed, I did not catch a single grub where the trees were limed. I do not mean to speak with confidence; I am, however, strongly encouraged to believe the remedy perfect. It was ascertained by professor Peck, that the insect seldom descended into the ground at a greater distance than three or four feet from the trunk, and to the depth of four inches, or that the greater part come within that distance. The lime is known to be destructive to all animal substances, and I have little doubt that it actually decomposes and destroys the insect in the chrysalis state; at least, I hope this is the case. There are many reasons which should encourage the repetition of this experiment. The digging round the trees is highly useful to them, while tarring is very injurious. The expense is not great; a man can dig round fifty large trees in one day. The lime is a most salutary manure to the trees. After the spot has been once opened and limed, the labour of keeping it open will not be great. Three hogsheads of air-slacked lime, or sweepings of a lime store, will suffice for fifty trees, and will cost three dollars. As it is done but once a year, I think it cannot be half so expensive as tarring. I repeat it, sir, that I mention my experiment with great diffidence, as being the first of my own knowledge. It may induce several persons to try it in different places, and where trees are surrounded with others which are treated differently. All I pray is, that it may prove to be successful, and relieve us from this dreadful scourge, which defaces our country, while it impoverishes and disappoints the farmer. If it should succeed, Mr. Knapp will merit the thanks of the publick for his ingenious experiment."

The foregoing valuable communication from one so highly deserving of confidence, it is hoped will have its proper influence, and encourage every proprietor of an orchard to make the experiment, whenever the canker worm shall again menace us with its ravages. The application of lime appears to be by far the most eligible remedy that has heretofore been proposed. It forms, after being exposed to rain, a hard crust impenetrable to moths or worms. If it should be generally adopted, it is very probable that these pernicious insects will be finally exterminated. It might be profitable to make the experiment upon a small scale, by confining some of the moths or worms, in their different states, in a box of earth, and applying the lime, so as to ascertain how far they will be able to progress through it, and whether the lime will have the effect of decomposing them. It has already been intimated, (page 58,) that flax-rubbish and sea-weed, might be laid round orchard trees so as to prove a remedy against these insects. Those substances, when beaten down by rains, soon become so firm and solid, as to prevent the growth of grass, and I should judge it would be impossible for the insects to penetrate through them.

It was recommended by Dr. Dean, to endeavour to effect the destruction of canker worms through the agency of swine. These animals appear to possess a natural instinct directing to search with their snouts for vermin and insects, which conceal themselves in the earth. They should, when circumstances permit, be suffered to run unrestrained, in orchards, during autumn and spring, for that purpose. I am authorized to say, that in several instances in this vicinity, the experiment has been made, and proved in a great degree effectual. A general resort to this expedient, might have a happy tendency in preventing the annoyance of these, and other insects, in our orchards.

It is well known, that several species of birds feed voraciously upon the canker worm, and other tribes of insects; it would be advantageous, therefore, to encourage the increase of the feathered tribe, by all the means in our power.

CATERPILLARS.

These vermin are so truly disgusting in their nature and appearance, and so injurious by their devastations, that every farmer should consider it disgraceful, to suffer his orchard to be infested by them; yet it is not uncommon to see numerous branches of valuable fruit trees entwined with nests, filled with these industrious reptiles, by which the foliage and fruit are destroyed. During an excursion this season, I have witnessed the disgustful sight of more than twenty large caterpillars' nests on a single tree, and almost every green leaf devoured. It would consist more with the interest and credit of the proprietor, were such neglected trees no longer permitted to encumber the ground.

The eggs from which caterpillars are produced, are attached in clusters to the small twigs by a brownish coloured miller, in the month of August, and are securely covered with a gummy substance, unsusceptible of injury by the weather during winter. The young brood is hatched by the warmth of the sun, just in time to prey upon the fresh leaves as they appear in the spring. The numerous family from each cluster of eggs, immediately unite in the labour of constructing a nest of strong web, which affords them a shelter from the inclemency of the weather, and a secure retreat from the dews at night. They continue to feed upon the leaves until about the last of June, when they abandon their habitation, and stroll to some dry, secure place, where they envelop themselves in a close covering of an egg-shaped, roundish ball, very similar to the *cocoon* of the silk worm. In this chrysalis state, they continue a few weeks, and in the month of August they burst forth in the form of a brownish coloured miller, the female of which soon wings her way to the apple trees, and deposits her eggs on the twigs, in the same manner as her progenitor, in the preceding year. Thus is an annual progeny generated, and in this manner is the species perpetuated. It will therefore appear evident, that if proper care be taken to destroy these vermin annually, and if all proprietors of orchards will act in concert with this view, the species may be entirely annihilated. The clusters of eggs which contain the young brood, very nearly resemble in colour the bark of the tree, but by a vigilant search they may be detected, and at any leisure time after the month of August, the twigs to which they are attached, should be cut off, and burnt, or the eggs otherwise destroyed. But when this is omitted, and the caterpillars are hatched, and have constructed their nests, and are rambling among the branches for food, a different method must be adopted. The trees during the spring and first part of summer should be carefully searched every two or three days, in the morning or evening, while the insects are enclosed in their tents, when they are easily crushed with the fingers, or some instrument, or the branch may be cut off and destroyed. It is asserted that spirit of turpentine, or common fish oil, applied to the nest will penetrate through, and kill every caterpillar within it; and it is also said, that soap suds will answer the same purpose. Mr. Yates, of Albany, says, he has formerly, and for several successive years, early in the morning while the caterpillars were confined to their nest or web, taken them off and destroyed them. By a repetition of this practice two or three times a week, for two or three weeks successively, they were totally destroyed; but of late he has discovered a more easy and expeditious method, and which effectually answers the purpose. Take a handful of wormwood, one of rue, and two of Virginia tobacco; (a sufficient quantity of tobacco alone will do, but not so well;) boil these together in about two pails full of rain water, for nearly half an hour; strain it through a cloth, and with this liquor sprinkle the trees. He performs this with a barrow engine; but the operation should be performed when the caterpillars or worms have left their nocturnal nest or web, and are dispersed on the trees. Repeat the operation two or three times; they will drop down and expire.

An eligible method of exterminating the caterpillar, will be found in the following communication, from the honourable Mr. Pickering, to the corresponding secretary of the Massachusetts agricultural society. (vol. IV. p. 326. Agricul. Repos.)

Description of a Brush for destroying Caterpillars Nests.

Wenham, May 26, 1817.

DEAR SIR,—For the last three or four years we have had very few caterpillars. Last week I observed an increased number, though not many, on my young apple trees. How to destroy them *most easily*, was a question which had occurred as often as I had seen orchards infested with them: while I always considered it disgraceful to a farmer to suffer his trees to be stripped of their leaves, and their fruit, for that season at least, to be destroyed; seeing it was very practicable to get rid of them, and without much trouble, by crushing them, when small, with the fingers. This was my father's mode when I was a boy. The same long, light ladders, which served in autumn in gathering his winter fruit by hand, enabled one to come at most of the caterpillars' nests in the spring. On this effectual example I have myself practised, since I became a farmer. Some over delicate persons might object to this mode; but it is really far less offensive than the bare sight of large and numerous nests with which apple trees are sometimes filled. And if the operation be performed early, when the caterpillars are only from a quarter to half an inch long, the operator (man or boy) will feel no repugnance to the process. But in full grown trees, some nests, towards the extremities of their small limbs, would escape, because not accessible by ladders. A narrow brush, formed with small bunches of bristles, in a single row, I once thought would reach and destroy them; but it was not found effectual nor convenient. Last Saturday morning the idea of the proper kind of brush occurred to me, and in the forenoon I tried it with complete success.

I presume every farmer has observed, that the clusters of eggs, producing caterpillars, are laid round the slender twigs of the apple tree and wild cherry, and effectually guarded by a gummy covering, until vegetation commences in the ensuing spring. When first hatched, the worms appear about the eighth of an inch long. The same warmth in the air, which opens the buds, hatches the caterpillars to feed on the embryo leaves. Their first object is to provide for themselves a tent for shelter, in their new state, against the inclemencies of the weather. For this purpose, they crawl to a small fork of a limb, where the branches form a sharp angle, and there spin and weave a web, with which they surround it, and where they are secure against undue cold, and heat, and rain. By this small white web they are discovered, and are then most easily destroyed. But the clusters of eggs are not all hatched at the same time. According to their situation for warmth or coolness, they are hatched some days earlier or later. At a distance, therefore, of a week or ten days after the first visit, an orchard should be again inspected, and all the latter broods destroyed. If neglected in this first state, they soon, by their growth, become straitened for room; and, having also consumed the nearest forage, they march and take a new station, and there form a new, but more ample tent. By such neglect the mischief of their ravages is increased, and they are with more difficulty destroyed.

The efficient and convenient instrument above mentioned, for this work, is nothing more than a common bottle brush fastened on the end of a pole. Having an old one in my house, I was enabled to make the experiment on the day when the idea of so applying it occurred to me. This brush is made of hog's bristles, introduced between two stiff wires closely twisted, and, being convenient in cleansing the insides of bottles, is probably familiarly known wherever liquors are bottled. For the information of others, I will mention, that a piece of wire, full one tenth of an inch in diameter, about three feet long, doubled, and leaving a small loop in the middle, is closely twisted for the length of about eight or ten inches from the loop; and then the bristles, being introduced between the remainder of the two branches of the wire, and these closely twisted upon them, the bristles are immoveably fixed, and thus form (after being uniformly sheared,) a cylindrical brush, about six inches long, and two inches and a half in diameter. To fasten this conveniently to a pole, with a small gouge, I made a groove about seven or eight inches long at the small end of the pole, in which nearly all the handle (the naked portion of the twisted wire) of the brush was laid, and bound on with three strings.

In using the brush, press it on the small nest, and turning the pole in the hand, the web is entangled with the bristles and removed; otherwise you rub the fork of the limb, inside and outside, with the brush, when nest and worms are surely killed or brought down. That the experimenter may see its mode of operation, he may apply the brush with his hand to a nest within his reach. Spruce poles are eligible, because that wood is light and stiff. For my small trees, I found a common bean pole (used for running beans to climb on,) six or seven feet long, sufficient; and for them a larger pole would be inconvenient. For taller trees, poles proportionably long must be provided.

If you are satisfied, by my account, of the utility of this simple instrument for destroying caterpillars, you may think it proper immediately to make it publickly known. Should the description be more minute than is requisite for communicating a clear idea of it, and of its application, you will abridge it.

With respect and esteem, &c.

TIMOTHY PICKERING.

THE WORM CALLED THE BORER.

An interesting paper by W. Denning, Esq. on the subject of the alarming decay of apple trees, is inserted in the first volume of the transactions of the New York agricultural society; from which it appears, that on cutting down some apple trees, which were far decayed, he discovered two worm holes running perpendicularly, from the tap root, through the heart. These holes were large enough to admit a pipe stem, and reached about fourteen inches above the surface; and from each hole a worm was taken. In some trees eight or ten holes were found. Mr. Denning proposes no remedy; but Dr. Mease, editor of the domestick encyclopedia, observes, that the worm must be searched for with a wire, and bored out. The publick are particularly indebted to J. Prince, Esq. and to Mr. E. Hersey, of Roxbury, for their mode of destroying this pernicious insect.

From the Massachusetts Agricultural Repository, volume IV. On a worm which attacks the apple tree. By John Prince, Esq.

Jamaica Plains, July, 1819.

Dear sir,—I have, within a few years past, lost a number of apple trees of from ten to fifteen years old, and was not able to account for it. My young trees also, that were beginning to bear, produced chiefly wormy and knurly fruit. The last year I found what I supposed to be the cause, which was a small, white, ringed worm, about three quarters of an inch long, with a dark coloured head, (I believe the same that attacks the peach tree,) attacking them at and just below the surface of the ground. I mentioned the subject to professor Peck, yourself, and several other gentlemen, who had never heard of this destroyer of the apple tree. I feared much the loss of all my trees, of which I have near one thousand, and mostly of my own planting. This spring, a man, who was grafting for me some old trees, told me he had trees that had been affected in the same way, and that they were very easily got rid of, by digging round the trees, and clearing away the earth to the roots, and then, with a sharp pointed knife, a chisel, or gouge, (and a small wire to probe, if they were deep in the tree,) they were easily destroyed. I employed him in June for this purpose. I believe there was not an apple tree on my farm but had some worms; and from some of them twenty-four were taken; and the trees almost entirely girdled, and would not, probably, have lived through the year. After taking out all that could be found, the wounds were covered over with grafting clay, and a large proportion of dry wood ashes, mixed, and the earth then returned to the tree. I shall have them again examined this fall, and looked at every spring. The trouble is much less than would be imagined, till tried. One capable man will dig round and turn the sods, two or three feet from the tree, (and which is also extremely beneficial to young trees in grass ground,) and examine at least thirty trees in one day; and in garden, or ploughed ground, one hundred.

When it is found how little expense is required to extract these destructive little worms, I do hope those persons who have young trees particularly, would examine them as soon as possible. They are soon discovered by the worm casts, or saw-dust borings, which should be followed, and wholly extracted.

I have also lost several mountain ash and quince trees by, I believe, the same destroyer.

Report of a committee to whom was referred the application of Mr. E. Hersey.

The committee appointed by the trustees of the Massachusetts agricultural society, to inquire into the facts relative to the destruction of the worm called the borer, which has of late years been so injurious to the apple trees in this neighbourhood; and to ascertain whether any thing be due to the exertions and adroitness of Mr. Ebenezer Hersey, of Roxbury, housewright, and generally known as a successful *grafter*, in destroying this troublesome and voracious insect, beg leave to report:—That they find, although it be uncertain whether Mr. Hersey was the first person who discovered the easy mode now practised by him, in taking the insect from the body of the tree, yet they are satisfied that the great advantage which the publick are like to derive from the extirpation of this worm, is principally owing to the exertions and cleverness of Mr. Hersey in this branch of his profession; and they recommend that a premium be awarded him of twenty-five dollars.

Your committee feel it incumbent on them to state, for your information, that Mr. Hersey has extirpated the insect in at least a thousand apple trees on *one* farm in Roxbury; that he has probably saved many thousands in other parts of that town, and its neighbourhood, either by his personal attendance and labour, or by the information which he has given to others on the subject; that he has restored to vigour and soundness many valuable peach trees that were gummy, and rapidly declining, from the effects produced by this, or a similar worm; that he has traced them to the mountain ash, and saved many of those beautiful trees from perishing: and your committee have no doubt, if, from his example, the farmers of this commonwealth will examine their orchards, and cut out those insects from their trees, wherever found, they will, in a short time, feel the benefit of their attention to the increased and improved quality of their fruit.

Your committee feel it their duty also to add, that from their own experience, they feel assured, that all those who can command the services of Mr. Hersey, will find it more economical to employ him to perform this work, than to undertake it themselves; as his experience and original profession of housewright, acquainted with the use of tools, enables him to do it not only more thoroughly, but very much quicker than any one can who has not been in the practice of the art.

The seasons when this operation is performed with most effect, are the spring and fall; and if in the spring, before the month of June, as the perfect insects escape before that time. In apple and mountain ash trees, the existence of the animal in the tree may generally be known, by the mossy appearance on the bark; and it may be traced by removing a little earth from the body of the tree, next above the insertion of the great roots. Although the hole at which the insect enters, is, in many instances, very small, yet it is easily discovered by an appearance of powdered wood, or fine saw dust, which is thrown out by the worm;—here you may introduce your chisel, and follow his track. Cut the bark smooth, and when you have cleansed the tree of all the insects, (of which there are sometimes as many as twenty to be found,) plaster the wounds over with a little clay, and when it is dry, restore the earth to its place. The operation should be renewed the succeeding season, to make the work complete. In peach trees the insect is traced by the gum; but as this is also produced by bruises, it is not infallible.

Samuel G. Perkins, } Committee.
John Prince, }

Note.—If the frost be out of the ground, we recommend to farmers to perform the spring cleansing as early as March and April.

Boston, April 16.

Having so happily discovered a method of destroying this pernicious reptile, it still remains extremely desirable to devise some means by which its successful attack upon the tree may be prevented. We are unacquainted with the natural history of this worm, but it is highly probable that is the progeny of the fly which deposits its eggs in the bark of the peach tree. Whether this be the fact, or whether it derive its existence from some source in the earth, it is reasonable, from its habit, to suppose that the soil or mould is congenial to its nature, and that native instinct directs it to enter the tree, for its future residence and support. The most obvious mode of prevention, therefore, which reflection has suggested, is the following. Early in the spring, let the soil from around the trunk of the tree be removed, down to the roots, and fill up the vacant place with some substance that would prove obnoxious to the fly or worm, or that would infallibly resist its powers to penetrate the bark. Among the substances which appear most likely to prove successful, I will mention the flax rubbish and sea-weed, page 58 of this volume. The next which occur, are ashes, lime, sea-shells, sea-sand, mortar-rubbish from old buildings, clay, tanner's bark, fragments of leather from the tanner's and shoemaker's shops, &c. Some, or perhaps any of the abovementioned substances, if pressed closely round the trunk of the tree, must inevitably prevent the fly or worm from having access to the bark, and of course prove an effectual remedy. Should it be the case, that the worm advances from some distant part in search of the tree, it is possible, on meeting foreign substances, to which it has not been habituated, its instinctive faculties may be baffled, or it may die before it can effect its object. Besides the expedient just described, another remains to be mentioned; it is the application of the clay paint, page 74, or the following composition, which is preferable. Take equal parts of quick lime, cow dung and clay, which by the addition of soap suds and urine, should be reduced to the consistence of common paint. To make it more adhesive, add a little hair. Let the whole stem, from the roots to the branches, be enveloped with a coating of this composition, and occasionally repeated, and it will scarcely be possible for the fly or worm, or insects, to injure the trunk of the tree; and it will at the same time prove conducive to its health and vigour. It might even be recommended to make this application to all young trees, at the time of transplanting, especially in places where the worm is known to prevail.

It appears that this destructive worm is rapidly extending its ravages among our orchard trees. In attending to the examination of my own trees since writing the above, (September 4th,) I was astonished to find that more than half of them were suffering injury by the borer, in considerable numbers, fifteen being taken out of a single tree; I was struck with the remark of the workman, that those trees which were surrounded by a cluster of root suckers, were in particular the greatest sufferers; and when a tree had suckers on one side only, the worms were found on that side of the tree. It is not improbable that the suckers and leaves facilitate the operation of depositing the eggs by affording a convenient shelter for the fly or moth; but we are destitute of the natural history of this insect. The suckers and worms all being removed, I directed the wounds made in the trees, and also the whole trunk near the surface of the earth, to be covered with a mixture of clay and cow dung, with a little hair to render it more adhesive; and afterwards a circuit of about three feet round each tree, to be covered with tanner's bark, or refuse leather.

SLUG WORM, OR NAKED SNAIL.

It is from the accurate observation of professor Peck, that we are enabled to present the reader with the history of the slug worm, by which, of late years, our fruit trees have been infested. These reptiles make their appearance upon the leaves of fruit trees, in the month of July, and our ingenious professor has discovered, that they are the progeny of a small black fly, which deposits its eggs in the leaf in the months of May and June, and in fourteen days after the deposit, the perfect slug is found adhering and feeding on the leaves. It is of an olive colour, with a slimy coat, and in the course of twenty days, it throws off four skins, at nearly equal periods; it remains in the fifth, or last viscous skin, six days, and acquires its full growth; it then quits this fifth skin, which is left adhering to the leaf, and appears in a clean yellow one, entirely free from vicidity, and has so different an aspect that it would not be supposed to be the same larvæ. After resting some hours, it proceeds slowly down the tree to the earth, into which it enters to the depth of from one to four inches; and in about eighteen days they again ascend from the earth, in the form of flies, and these again deposit their eggs in the leaf; so that they produce two hatchings in a year.

It is happy for the fruit planter, that a simple method is discovered, by which these destructive insects may be effectually destroyed. This is done by means of lime sprinkled over the leaves in the form of powder. For this purpose, a wooden box, of convenient size, having its bottom perforated with numerous small holes, is to be filled with lime. This being mounted on a pole, by shaking over the tree, distributes the lime among the leaves, and the slugs are immediately destroyed. The labour is very trivial; a man may cover a large tree in three or four minutes; and the desired effect is certain. Fine earth shaken through a basket or perforated box, will answer equally well.

Another remedy, it is said, will prove equally effectual. It is a strong infusion of tar, made by pouring water on tar, and suffering it to stand two or three days, when it becomes strongly impregnated. This, if sprinkled over the leaves by means of an engine, will kill these vermin instantaneously. Tanners bark put round fruit trees, will destroy the slug worm.

The following letter from E. Perley, esquire, is extracted from the Massachusetts Agricultural Repository, vol. 3, page 144.

LICE, INFESTING YOUNG ORCHARDS, IN THE DISTRICT OF MAINE—MODE OF DESTROYING THEM.

" This insect, called *lice*, is in form like half a kernel of rye, (but not more than one twentieth part so large,) with the flat side sticking to the smooth bark of the tree. They resemble blisters; and are near the colour of the bark of the tree. These blisters contain from ten to thirty nits or eggs each, in form like a snake's egg; which, in a common season, begin to hatch about the 25th of May, and finish about the 10th of June. These nits produce a white animalcule, resembling a louse, so small they are hardly perceptible by the naked eye; which, immediately after they are hatched, open the passage at the *end* of the blister, and crawl out on the bark of the tree; and there remain, with but little motion about ten days; when they stick themselves fast to the bark of the tree, and die. From this little carcass arises a small speck of *blue mould*, which is most plain to be seen between the 10th and 20th of June, and continues about fifteen days; and then gradually wears off, until the old carcass appears, which, by this time is formed into a new blister, and contains the spawns or nits before mentioned.

"These blisters prevent the circulation of sap, and prove as fatal to the tree as the canker worm.

"In order to remedy the difficulty, I have made many experiments within a few years; but long to no good effect, not knowing then the particular season when these animalcules could be most easily destroyed. This, however, I have lately found to be between the time they hatch, and that when the mould leaves them.* The application that I have found most effectual is, washing the trees with lye or brine. Lime, also, mixed with lye, to the consistence of white wash, may be useful. And although the *small* branches cannot be cleansed in this manner without much difficulty, still, if the body of the tree, and the branches near the body are kept clean until there comes a *rough* bark, I think the lice will not kill *the tree.*

"Some people have recommended the application of *train oil* to the tree, which, indeed, is a powerful antidote against lice, but being of a glutinous quality, is very detrimental to the tree. *Inoculation* has been proposed; which, I think, will have no effect at all on the lice; for I perceive they hatch in May, on branches that were pruned off the tree in March, and the sap entirely extinguished.

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* "It appears from this account, by Mr. Perley, that these appearances can, in general, only occur between May 25, and July 5."

"These lice are natural in the *uncultivated* forest, on what is called moose-wood, and other bushes.

"Much care should be taken on their first appearing in an orchard or nursery; as the cutting down and destroying a few young trees is of no importance, compared with the difficulty of having an orchard overrun with them.

"P. S. The brine or pickle, with which the tree is to be washed, should not be such as has had meat salted in it; but let one quart of common salt be dissolved in two gallons of clean water."

As a remedy against these lice, the *clay paint*, mentioned, page 74, may be recommended. If this were properly applied to the trunk and branches of the tree after the eggs are hatched, it would so completely envelop the insects as probably to counteract their mischievous effects.

CURCULIO.

The following is extracted from the Domestick Encyclopedia, edited by Dr. Mease.

"The editor is indebted to his excellent friend, Dr. James Tilton, of Wilmington, Delaware, for the following original and very valuable communication, on the subject of the insect, which has been so actively engaged in destroying the fruit of Pennsylvania, Delaware, (and, probably, of the other states,) for a few years past. It were to be wished, that other gentlemen among us, who have opportunities, would be equally attentive with Dr. Tilton, in communicating their observations upon this subject of rural economy.

"Curculio, a genus of insects belonging to the *coleoptera*, or *beetle* order. The species are said to be very numerous. The immense damage done, by an insect of this tribe, to the fruits of this country, of which there is no similar account in Europe, has given rise to a conjecture, with some naturalists, that we have a peculiar and very destructive species in America.

"The manner in which this insect injures and destroys our fruits, is by its mode of propagation. Early in the spring, about the time when our fruit trees are in blossom, the *curculiones* ascend in swarms from the earth, crawl up the trees, and as the several fruits advance, they puncture the rind or skin with their pointed rostra, and deposit their embryos in the wounds thus inflicted. The maggot, thus buried in the fruit, preys upon its pulp and juices until, in most instances, the fruit perishes, falls to the ground, and the insect, escaping from so unsafe a residence, makes a sure retreat into the earth; where, like other beetles, it remains in the form of a grub or worm during the winter, ready to be metamorphosed into a bug or beetle, as the spring advances. Thus every tree furnishes its own enemy; for although these bugs have manifestly the capacity of flying, they appear very reluctant in the use of their wings; and perhaps never employ them, but when necessity compels them to migrate. It is a fact, that two trees of the same kind may stand in the nearest possible neighbourhood, not to touch each other, the one have its fruit destroyed by the curculio, and the other be uninjured, merely from contingent circumstances, which prevent the insects from crawling up the one, while they are uninterrupted from climbing the other.

"The curculio delights most in the smooth-skinned stoned fruits, such as nectarines, plums, apricots, &c. when they abound on a farm: they nevertheless attack the rough-skinned peach, the apple, pear, and quince. The instinctive sagacity of these creatures directs them especially to the fruits most adapted to their purpose. The stone fruits more certainly perish by the wounds made by these insects, so as to fall in due time to the ground, and afford an opportunity to the young maggot to hide itself in the earth. Although multitudes of seed fruits fall, yet many recover from their wounds, which heal up, with deeply indented scars. This probably disconcerts the curculio, in its intended course to the earth. Be this as it may, certain it is, that pears are less liable to fall, and are less injured by this insect than apples. Nectarines, plums, &c. in most districts of our country, where the curculio has gained an establishment, are utterly destroyed, unless special means are employed for their preservation. Cherries escape better, on account of their rapid progress to maturity, and their abundant crops: the curculio can only puncture a small part of them, during the short time they hang upon the tree. These destructive insects continue their depredations from the first of May, until autumn. Our fruits, collectively estimated, must, therefore, be depreciated more than half their value.

"It is supposed the curculio is not only injurious above ground, but also in its retreat, below the surface of the earth, by preying on the roots of our fruit trees. We know that beetles have, in some instances, abounded in such a manner as to endanger whole forests. Our fruit trees often die from manifest injuries done to the roots by insects, and by no insect more probably than the curculio. In districts where this insect abounds, cherry trees and apple trees, which disconcert it most above, appear to be the special objects of its vengeance below the surface of the earth.

"These are serious evils; to combat which, every scientifick inquirer is loudly called upon to exert his talents; every industrious farmer to double his diligence; and all benevolent characters to contribute their mite.

"Naturalists have been accustomed to destroy vicious insects, by employing their natural enemies to devour them. We are unacquainted with any tribe of insects able to destroy the curculio. All the domestick animals, however, if well directed, contribute to this purpose. Hogs, in a special manner, are qualified for the work of extermination. This voracious animal, if suffered to go at large in orchards, and among fruit trees, devours all the fruit that falls, and among others, the curculiones, in a maggot state, which may be contained in them. Being thus generally destroyed in the embryo state, there will be few or no bugs to ascend from the earth in the spring, to injure the fruit. Many experienced farmers have noted the advantage of hogs running in orchards. Mr. Bordley, in his excellent 'essays on husbandry,' takes particular notice of the great advantage of hogs to orchards: and although he attributes the benefits derived from these animals to the excellence of their manure, and their occasional rooting about the trees, his mistake in this trivial circumstance does by no means invalidate the general remarks of this acute observer. The fact is, hogs render fruits of all kinds fair and unblemished, by destroying the curculio.

"The ordinary fowls of a farm-yard are great devourers of beetles. Poultry, in general, are regarded as carnivorous in summer, and therefore cooped some time before they are eaten. Every body knows with what avidity ducks seize on the tumble bug, (*scarabæus carnifex,*) and it is probable the curculio is regarded by all the fowls as an equally delicious morsel. Therefore it is, that the smooth stone fruits, particularly, succeed much better in lanes and yards, where the poultry run without restraint, than in gardens and other enclosures, where the fowls are excluded.

"Even horned cattle, and all sorts of stock, may be made to contribute to the preservation of our valuable fruits. By running among the trees, they not only trample to death multitudes of these insects, but by hardening the ground, as in lanes, it becomes very unfit to receive or admit such tender maggots as crawl from the fallen fruits. Besides, the curculio is very timid, and when frightened by the cattle rubbing against the tree, or otherwise, their manner is to roll themselves up in a little ball, and fall to the ground, where they may be trampled and devoured by the stock, poultry, &c. Colonel T. Forest, of Germantown, having a fine plum tree near his pump, tied a rope from the tree to his pump handle, so that the tree was gently agitated every time there was occasion to pump water. The consequence was, that the fruit on this tree was preserved in the greatest perfection."

GATHERING, AND PRESERVING APPLES.

The fruit orchard having attained to that productive state, in which the proprietor is about to remunerate himself for his labour and attention, it is still requisite to exercise due judgment and discretion in the grateful employment of collecting his crop. The injudicious method commonly practised in gathering apples is more destructive in its consequences than is generally understood. The first requisite is, to ascertain precisely when the fruit is fully ripe, as it is said, that the longer winter apples are suffered to remain on the trees, provided they are not overtaken by frost, the longer they may be preserved. In hot climates, and in hot seasons, fruit attains to maturity and ripeness earlier than in colder ones, because the sap performs its office more rapidly. It may be considered a correct rule, that apples are ripe when those that are sound and fair fall naturally from the trees, or separate very readily on being lifted by the hand. They should be gathered during a clear dry air, after the dew has evaporated. According to the late philosophick Dr. Darwin, in order to ascertain when fruits, for instance, apples and pears, are sufficiently ripe for gathering, it is requisite to attend to the colour of the skin enclosing the seeds. During their infant state, there is no cavity round the kernels, but they are in contact with the seed vessels. In a subsequent period, when the fruit has exhausted the nutricious matter, the cells containing the seeds become hollow, and the latter assume a dark colour. This, Dr. D. observes, is the proper criterion by which to judge when such fruits should be gathered; as it indicates that they will not continue to increase in size, but waste and become hollow, by absorbing the mucilaginous particles from the centre. In gathering apples and pears, it is necessary carefully to avoid injuring the blossom buds, which are already formed for the next year's fruit. These buds are placed at the side of the foot stalk of the fruit, and if the spurs are broken, there will be no fruit on that part the next season. The pressing against the trees, therefore, with heavy ladders, and the rash practice of thrashing the limbs with poles, ought to be entirely abandoned; for by such means, the bark and limbs are bruised, and the blossom buds for the succeeding year are destroyed. Instead of ladders, stepping frames should be employed, and a pole, furnished with a hook at the end, and covered with coarse cloth, may be used to shake the small limbs, without injuring the bark. When perfectly ripe, apples for cider may be shaken off without injury to the buds, but still they will be bruised, unless the ground be covered with blankets or straw. Particular care is requisite in gathering winter fruit for keeping: they should be gathered by the hand, and without injury, removing them from the gathering basket to the casks prepared for them, with great care: if bruised, they soon decay; and the less those that are sound are moved, the better. When in barrels, they should be placed in a dry, cool, shaded situation, above ground, and remain until danger by frost, and then put into the cellar.

The following valuable observations, contained in a letter from N. Webster, esquire, have been published in the Massachusetts Agricultural Repository, from the Connecticut Courant.

PRESERVATION OF APPLES.

"It is the practice with some persons, to pick them in October, and first spread them on the floor of an upper room. This practice is said to render apples more durable, by drying them. But I can affirm this to be a mistake. Apples, if remaining on the trees as long as safety from the frost will admit, should be taken directly from the trees to close casks, and kept dry and cool as possible. If suffered to lie on a floor for weeks, they wither and lose their flavour, without acquiring any additional durability. The best mode of preserving apples for spring use, I have found to be, the putting them in dry sand as soon as picked. For this purpose, I dry sand in the heat of summer, and late in October put down the apples in layers, with a covering of sand upon each layer. The singular advantages of this mode of treatment are these: 1st. The sand keeps the apples from the air, which is essential to their preservation. 2dly. The sand checks the evaporation or perspiration of the apples, thus preserving in them their full flavour—at the same time, any moisture yielded by the apples, (and some there will be,) is absorbed by the sand; so that the apples are kept dry, and all mustiness is prevented. My pippins, in May and June, are as fresh as when first picked; even the ends of the stems look as if just separated from the twig."

An English writer recommends the use of dry pit sand, for the preservation of apples and pears. Glazed earthen jars are to be provided, and the sand is to be thoroughly dried. A layer of sand, an inch thick, is then to be placed in the bottom of the jar; above this, a layer of fruit, to be covered with a layer of sand, an inch thick; then lay a second stratum of fruit, covering again with an inch of sand. An inch and a half of sand may be placed over the uppermost row of fruit. The jar is now to be closed, and placed in a dry, airy situation, as cool as possible, but entirely free from frost. Wheat bran is sometimes substituted for sand.

"One of the most easy methods," says Dr. Darwin, "of preserving fruit is that of depositing it in ice-houses, where it may remain in a frozen state for a considerable time. And if the fruit be afterwards gradually thawed, by covering it with melted ice, or immersing it in cold spring water, it will lose but little of its flavour, provided it be consumed on the same day."

Mr. Forsyth gives the following directions for picking and preserving fruit. "All apples, pears, &c. ought to be carefully picked by hand, and laid in baskets containing dried grass, to prevent them from being bruised; and if they fall spontaneously, some dry barley straw, or pease haulm should be prepared for their reception on the ground; in the latter instance, the fruit ought to be separated from, and sent to table before that which is collected by hand; and such as may be accidentally bruised ought to be reserved for culinary purposes, because it cannot be long kept in a sound state. When all the fruit is collected, it should be conveyed to the store room, laid gently, in small heaps, on dried grass, and their tops be covered with short grass, in order to *sweat*. Here it may remain for about a fortnight, during which time, each apple, pear, &c. must be occasionally wiped with a dry woollen cloth, and those exposed on the surface should be placed towards the middle of the heap. At the end of this period, all watery ingredients that may have been imbibed during a wet season, will be evaporated; the heaps should then be uncovered, and each article carefully wiped; separating those which may be injured, or unfit for keeping. During this process of sweating, the windows of the store room, excepting in wet or foggy weather, ought to be continually open, in order to discharge the moisture perspiring from the fruit. The usual method of storing pears, apples, &c. consists in laying them on clean wheaten straw; but in this case, it will be necessary to examine them frequently, and to remove such as begin to decay; because the straw, by absorbing moisture, will become so tainted as to communicate an unpleasant flavour." The best mode of preserving fruit, however, in the opinion of Mr. Forsyth, is that of packing it in glazed earthen jars, which ought to be kept in dry apartments. For this purpose, apples and pears are to be wrapped separately in soft papers, and laid at the bottom of the vessel, on a thin stratum of well dried bran. Alternate layers of bran and fruit are then to follow, till the jar be filled; when it should be gently shaken, in order to settle its contents. Every vacancy must now be supplied with bran, covered with paper, and the whole secured from air and moisture, by a piece of bladder, over which the cover of the vessel must be carefully fitted.

LIST OF APPLES

HELD IN MOST ESTIMATION IN THE UNITED STATES.

An accurate technical list of the various sorts of apples known in the United States, would be considered an acquisition of importance; but their names are derived from such various and capricious causes, or incidents, that a correct list cannot be easily accomplished; some have received names descriptive of the fruit, and others are derived from the places where they have been first found, or from the original cultivator. But a serious misfortune is, in several instances the same fruit bears many different names in different places; which subjects the planter to much inconvenience, as it not unfrequently happens, that grafts of a supposed new variety are obtained from a distance, under a different name, which eventually prove to produce the same kind of fruit, with which his orchard already abounds. I have this season received grafts from trees, called red queen apple, which, on examining the fruit of the last year, I discovered to be the Baldwin apple. William Coxe, esquire, of Burlington, New Jersey, possesses the most extensive orchard and cider establishment, it is presumed, in the United States, consisting of more than four thousand apple trees, besides other fruit. This gentleman has favoured the publick with a view of the cultivation of fruit trees, &c. which contains a descriptive list of one hundred and thirty-three varieties of apples, which are cultivated on his own plantation. To this list may be be added others, in various parts of the union, amounting, probably, to several hundreds. The following is from Dr. Mease's edition Domestick Encyclopedia: "The family of Prince, at Flushing, Long Island, have been many years celebrated for their fine fruit, and some of the choicest kinds to be met with, in various parts of the United States, have been brought from their nursury. A very extensive and excellent collection of fruits, both imported and native, was originally commenced, about ten years since, by William Coxe, esquire, of Burlington, New Jersey, and is now for sale by I. Smith & Co. at that place. In this grand collection, there are eighty kinds of apples, (now one hundred and thirty-three,) ninety kinds of pears, and fifty-one of cherries, nearly all imported, and one hundred varieties of peaches. Mr. Samuel Coles, of Moor's town, New Jersey, has also an excellent collection. Several French gentlemen, who have taken up their residence near Philadelphia, have done much in a few years towards improving our stock of fruits, by importing largely of the finest kinds from France; and there can be no doubt, if we take pains to propagate from the valuable stock in our power, that in a few years, the neighbourhood of Philadelphia may boast of as fine a collection as can be desired.

"Under the article apple, some important remarks were given on this subject; the editor has now great pleasure in presenting to the American publick the first attempt ever made to collect, in one view, a list of the finest kinds of apples growing in the United States. For the materials, of which this list was composed, he has been indebted to Mr. William Prince, of Long Island, Mr. R. Riley, of Marcus Hook, Chester county, William Coxe, esquire, of Burlington, and the honourable Judge Boudinot, of Newark, New Jersey; through whom, also, the valuable facts from Mr. John Ogden, of Newark, and from Mr. Asa Hillyes, of Orange, Essex county, New Jersey, were obtained; and he, with thanks, expresses his obligations to them for their ready assistance and communication. Attentive, however, as his friends have been, he cannot suppose that the list comprehends every apple in the United States; but he is satisfied, that the most valuable have been described, and he will gladly receive accounts of any others, which may have been unnoticed, and add them to the list, should another edition of this work be called for."

From the ample catalogues of Dr. Mease and William Coxe, esquire, and from other sources, I have selected a list of those which are held in most estimation, and such as are generally in demand at market.

Those marked c. are cider apples.

1. *American pippin*, c. "was brought from Maryland to Marcus Hook, thirty years since. It is of a flattish form, middle size, firm subtance, resembling the vandevere, and will keep till harvest. Mr. Coxe describes it as a long fruit, having a dull *red stripe*. Fourteen bushels of these apples are required, at Marcus Hook, to make one barrel of cider." (Mease.)

2. *American nonpareil*, or doctor apple, in Pennsylvania. "Will keep from November to March. A large red-striped apple, of excellent flavour, and very juicy. It keeps tolerably well during winter. The tree is subject to blast."

3. *Autumn*, or *fall pippin*. "Ripens in October. A large yellow apple, acid taste, and pleasant flavour. It is also a good kitchen apple. It usually weighs nineteen ounces. Keeps well."

4. *Aunt's apple*. "This is a beautiful and large apple, of an oblong make, resembling the Priestly in shape; the skin smooth, streaked with a lively red, on a yellow ground; the flesh is yellow, breaking and juicy; of an agreeable flavour, but not rich. It ripens in November, and, from its handsome appearance, is a valuable market fruit. The tree is small, the growth delicate, and its fruitfulness great. It is extensively cultivated in several of the eastern counties of Pennsylvania." (Coxe.)

5. *Baldwin apple*, or *Peeker apple;* is a very valuable red apple, large and beautiful, fine flavoured, and will keep till April. It is in high estimation in Massachusetts.

6. *Baltimore apple.* In the transactions of the horticultural society of London, published in 1817, it is stated, that a *large apple*, raised in the garden of Mr. Smith, near the city of Baltimore, was exhibited; it had been recently imported by captain George Hobson, of Baltimore, who sent it to sir Joseph Banks, by whom it was presented to the society. This apple, of which an engraving accompanies this account, weighed one pound seven and a half ounces; it measured in circumference one foot two inches and three quarters, and in height as it stood, was four inches, it proved very good, though over ripe; it was very close at the core, and, if a good bearer, will deserve general cultivation. The drawing is coloured, and very interesting.

Note by the editor of the American Farmer. "The apple here spoken of grew on the farm of Robert Smith, esquire, where, we are authorized to state, cuttings may be had for grafting."

7. *Black apple.* "Ripe in November; a very deep red. A much-admired fruit near Trenton, New Jersey. Mr. Boudinot, of New Jersey, says, "there is an apple lately discovered here, which is called by the owner of the orchard, a *black apple.* It appears to be a species between the Spitzenburgh and common black apple." (Mease.)

8. *Brownite.* In Mr. Riley's opinion, this is excelled by none for the table. It is ripe in September, and keeps well. It was discovered by Rowson, an old Swede, near Marcus Hook.

9. *Bow apple.* Ripens in June and July;—equal to any summer apple. It is juicy, tender, and mild; of a light yellow colour.

10. *Bell flower.* "A long yellow apple, of good flavour, very large, and excellent for the table, and

for cooking. When fully ripe, which is in October, the seeds may be heard to rattle, when shaken. This beautiful apple will keep well through the winter; and it is held in great estimation in the Philadelphia market."

11. *Bullock's pippin*, or *sheep's snout*. This is a native of New Jersey, and is sometimes called the *long tom*. It is in high repute, in autumn and the first part of winter, for its rich and sprightly juice, and is much admired when baked.

12. *Campfield*, or *Newark sweeting*, c. "Is a large sweet fruit, of a pale red colour; ripens about the beginning of October, and keeps well, if carefully picked. Being a rich fruit, it is necessary to mix the Harrison apple with it, in order to refine the cider produced from it."

13. *Cat-head*. "This is a very large, round apple, flattened at the ends, and deeply hollowed: the stalk is short and thick, so deeply sunk as to be almost imperceptible: the colour a greenish yellow, the flesh white: a good apple for cooking and drying, but apt to drop from the tree, from its great weight; and deficient in point of richness and flavour." (Coxe.)

14. *Catline*, c. A Delaware autumn cider fruit, and considered a pleasant eating apple, in its season. The tree is very productive, and an early bearer.

15. *Carthouse*, or *gilpin*, c. "This apple is said to have been brought from Virginia. It is highly esteemed for its excellence as a table apple, late in the spring, and as a good cider fruit. It is a most abundant bearer, and hangs on the tree very late in the season. The tree is hardy; of a handsome, open, spreading, and vigorous growth: the fruit is small; the colour a deep red, sometimes a little streaked with yellow; the skin of a polished smoothness; the form inclining to oblong. The flesh is very firm, yellow, and rich; not fit for eating until mid-

winter, when it becomes juicy, tender, and finely flavoured." (Coxe.)

16. *Cider apple*, c. "The apple propagated under this name is highly esteemed, as a most productive and excellent cider fruit, in the county of Bucks, and the contiguous parts of Pennsylvania. The size is middling; its appearance resembles the vandevere; the skin is smooth, a lively streaked red: it is a pleasant table fruit, but is chiefly used for cider. The tree is tall; the limbs shoot upward. It is sometimes loaded with fruit, beyond any other tree in our orchards; requiring great care to prevent the branches being destroyed by the weight of fruit. It ripens in October and November." (Coxe.)

17. *Codling*. The codling, called also the English codling, is a very fine fruit for pies and stewing, and is also a pleasant table apple. It grows very large and fair; the form is oblong, rather irregular; the skin is a bright, though pale yellow, with a fine blush, frequently, towards the sun; it is somewhat pointed towards the blossom end; the stalk short; the flesh white, tender and sprightly. The tree is uncommonly handsome, vigorous and fruitful; bearing very young, and constantly; the leaves are large; it makes a fine appearance in an orchard. The fruit is fit for stewing from the first of August, but does not become fully ripe until the end of that month, and continues in season till late in October. It is one of the profitable apples for market; ripening gradually, and being very free from rot." (Coxe.)

18. *Corlies sweet*, c. "This is a large, fair apple, rather long in shape, of a bright yellow colour, smooth skin, a faint blush, and a few small grey specks; the stalk is short, and of a middling thickness; the flesh is coarsely grained, white and sweet; it ripens in September and October, but will keep later for cider, for which it is highly esteemed.

The tree grows vigorously, with a singularly deep green foliage, and round head: it is a great bearer. It was brought from East Jersey." (Coxe.)

19. *Cooper's russeting*, c. "Keeps from October to May. A natural fruit, produced on the farm of Joseph Cooper, of New Jersey, who believes it to be of Indian origin; as the tree, from which he (when a young man) preserved a graft, was an old decayed tree, and the place on which it grew was originally the site of an Indian village. It is somewhat dry, but of a pleasant sweetish taste. This apple makes most excellent cider: it also is a good pie apple, and best when not pared. Pears, boiled in russeting cider, with about half sugar, make a good preserve. The trees bear abundantly every second year: the limbs spread horizontally, and are short. This excellent fruit, being justly esteemed, is much propagated by engrafting, in New Jersey." (Mease.)

20. *Flat sweeting*, or *hornet sweeting*, from the circumstance of its being a favourite of hornets, on account of its rich, sirupy juice. This is a flat apple, thin skin, and of a yellowish colour; flesh white, and juice saccharine and pleasant. Ripe in September, and will keep several months. It is doubtful whether this fruit is known out of the county of Plymouth. Its origin not ascertained.

21. *Gloucester white*, c. "This apple is of a middling size; of a shape not very uniform, varying from an oblong to a flat form; the colour, when ripe, is a bright yellow; rich, breaking and juicy; of a fine flavour, as a table apple; and producing cider of an exquisite taste. The stalk is of the ordinary length, inserted in a cavity of medium depth; the crown is moderately deep; the time of ripening is about the first of October, after which the fruit soon falls, and is fit for cider: it does not keep long, but, while in season, is a delicious table apple. The tree is very thrifty, hardy and vigo-

rous; of a regular and beautiful form, and very productive. It is much cultivated in the lower counties of Virginia; from whence I procured it, as an apple of high reputation." (Coxe.)

22. *Golden pippin.* "Keeps from October to January; slightly acid; yellow on one side, and red on the other: it is a good apple, according to Mr. Riley, and was brought from England by William Penn. It succeeds best on a sandy soil."

23. *Golden rennet.* "A beautiful and excellent apple, of a bright yellow tint, marked on the south side with faint red streaks, and yellow brown dots; its flesh is remarkably tender, and of a glossy white; the juice has the taste and flavour peculiar to pine apples, and which is also found in the golden pippin: when stored, it ripens in December, but attains to perfection only in February. The tree has a healthy appearance, and is of a middling size."

24. *Green everlasting.* "Light green colour; skin remarkably smooth and fair. This apple keeps well, until late in the summer, and some have kept perfectly sound more than a year from the time they were gathered." (Mease.)

25. *Green Newton pippin*, c. "It is of a flattish form, and green colour, when first gathered, turning yellow in the spring, and is justly esteemed the best table apple in America. It is supposed to have come originally from Holland, but Mr. Prince says, it originated in the town of Newton, Queen's county, Long Island, state of New York. In general, apples, kept till the spring, lose their flavour, and become mealy, but the Newton pippin may be kept till June, without losing either its juice or flavour. It is an excellent apple for cider, either alone, or mixed with others. Many varieties are raised from the seed of it, of a large size, but different in form and colour. Mr. Riley, of Marcus Hook, says, there are two varieties raised at Newton, in Chester county. The flat sort is much the best, and the great-

est bearer. It is an excellent apple for house use; makes a large quantity of cider, though of a thin quality. A large long kind, sometimes called lady-finger, is not so good; the taste is not so pleasant, and they have a thick skin. This apple is of a beautiful golden colour, in the spring. The trees of both those varieties grow larger, and are great bearers. Forsyth remarks, that the Newton pippin seldom ripens in England. Mr. Cooper, of New Jersey, remarks, that the Newton pippin does not thrive in a sandy soil." (Mease.)

26. *Grey house*, c. "Mr. Riley, of Marcus Hook, thinks this is not excelled by any for making cider: it is of a middling size, reddish grey colour, ripe in October. Cider is made of it in November. The tree bears but every other year, and then is heavily loaded. It is a very tender fruit, though late in blossoming. At the time of the formation of this fruit, it is very subject to perish by easterly winds, attended by cold rains, which frequently cause the apples to fall off in abundance, sometimes to the loss of the whole crop; and, on an average, the tree does not succeed in bearing a good crop above one fourth of the time. It was first discovered by P. Roman, in his township, (Marcus Hook,) by a natural tree, that grew close to his house; hence called his *house tree*, and by some, Roman knights. This tree is of a middling size, inclines to grow low, and is short lived. Twelve bushels of these apples are required to make a barrel of cider." (Mease.)

27. *Hagloe crab*, c. "According to Mr. Marshall, a gentleman in Herefordshire, England, Mr. Bellamy, produces cider from the Hagloe crab, which, for richness, flavour, and price on the spot, exceeds, perhaps, every other fruit liquor, which nature or art have produced. He has been offered sixty guineas for a hogshead, containing one hundred and ten gallons of this liquor." William Coxe, esquire, of Burlington, New Jersey, having

cultivated this fruit, describes it as follows: "The fruit, when fully ripe, has a yellow ground, streaked with bright red; the size about middling; the form round, flat at the ends; the stalk large; the flesh remarkably soft and woolly, but not dry; the taste acid, but highly flavoured; the quantity of juice smaller, in proportion to the fibrous matter, than in most other apples, requiring nearly one third more of the hagloes for a barrel of cider, than of common fruit; the juice, though uncommonly sheer, is singularly rich; and though the smell of the apple is faint, the flavour of the cider is high, and, when properly manufactured, is very rich. The colour of the flesh is pale, but that of the cider, dark; it ripens in August and September; keeps a long time without rotting; it bears abundantly and early; the growth of the tree is very uncommon; thick strong shoots; buds, particularly at the extremity of the branches, very large; the the colour of the wood dark; the size of the tree is small. The Hagloe is an uncommon fine cooking apple; and from its great beauty and large size, added to its abundant bearing, is a valuable market fruit."

28. *Harrison apple*, or *long stem*, c. "It is of a moderate size, and of a rich dry taste, with a tartness, that renders its sweetness agreeable and lively. It ripens about the beginning of November; keeps a long time, and answers well for culinary purposes. The cider made from this apple is clear, high coloured, rich, and lively. General Washington was presented with a barrel of it, by judge Boudinot, of Newark, New Jersey, and he declared his preference of it to that made from Hughes's Virginia crab. This fruit originated in Essex county, New Jersey, where it is now very extensively cultivated. The cider from this fruit sells from eight to ten dollars per barrel. Mr. Coxe observes, "as a more vinous, rich and highly-

flavoured liquor, I prefer the Harrison to the crab cider." (Mease.) "One tree of this kind, this year, (1817,) in an orchard in Essex county," says Mr. Coxe, "produced upwards of one hundred bushels, eighty-seven of which were gathered, when fully ripe; the others were fallen fruit, carefully measured, to ascertain the quantity."

29. *Harty sweeting*, c. A small yellow apple; ripens in autumn, and is considered a valuable cider apple, but not very useful for other purposes.

30. *High-top sweeting*. This tree, it is believed, is peculiar to the old Plymouth colony. The first settlers, either from choice, or for want of other varieties, cultivated it more generally than any other apple. It is now much on the decline. The fruit is under the middle size; of a yellowish colour, pleasant taste; but chiefly used for baking, and for drying. It is ripe in August, and is not long preserved. The tree is remarkable for its long upright stem.

31. *Holmes apple*, c. Was first planted by Z. Holmes, esquire, of Kingston, Plymouth county. He set in the ground a small sprout, without knowing its qualities, and in the eleventh year he gathered from it thirty bushels of apples. It is now much admired, and extensively cultivated, in this vicinity. The tree bears young, and every year; the more abundantly every second year. The fruit is of a middling size; the skin white, with a blush on the sun side. Ripe in November; keeps through the winter; has a pleasant flavour; and makes good cider.

32. *Holten sweeting*, c. It is among the excellences of this tree, that it flourishes in a thin soil, and that it bears remarkably early, and very uniformly. Ripe in September; and is an excellent fall apple for family use, and for cider of the first quality. It is deserving of general cultivation. No account of its origin has been obtained.

33. *Hughes's Virginia crab*, c. "A small fruit, of a light green colour, striped with red, and of a harsh unpleasant taste. Originated in Virginia; and is highly valued as a cider fruit, as its must is less disposed, from its great acidity, to rise too high in fermentation, than that of any other apple; and it has, besides, almost every other property of a cider apple. The trees bear abundantly; the fruit ripens late, and is free from rot of any kind; the fruit is small and hard, and, therefore, bears the fall from the tree, without bruising. It grinds small, and the pulp is remarkably tough, yet parts with its juice readily; and the must runs from the press very fine and clear.

34. *Lady apple.* Pomone d'apis. This is of French origin; of a bright red colour next the sun, and yellow and green on the other side. A most beautiful little apple, and of pleasant taste. It keeps well during the winter, and is a much admired dessert apple.

35. *Lady finger.* A long, tapering fruit, of a beautiful yellow and red colour. It is well flavoured, and keeps until June. The tree bears abundantly.

36. *Large red and green sweeting.* Ripens in September. A very large fruit, weighing a pound. Red, streaked on a yellow ground; the flesh sweet and tender.

37. *Large early harvest.* "Ripens in June and July. It is usually as large as a middle sized Newton pippin; of a pale yellow colour, when ripe; of a pleasant acid taste, and answers best for tarts, and may be used for that purpose, when no larger than a nutmeg; but cutting them in two equal parts, without peeling." (Mease.)

38. *Loring sweeting.* The apple, known by this name, was brought from the county of Bristol, by Mr. E. Loring, of Plympton, Plymouth county, and is much cultivated in this vicinity; its origin, or the

name by which it is distinguished in other parts of the country, I have not been able to ascertain. The fruit is large and fair; of a pale yellow colour; the flesh is sweet, and extremely pleasant; abounding in a rich sirupy juice; and, as a baking apple, it is of superiour excellence. It ripens in autumn, and retains its good properties till March. This fruit ought to be introduced into every orchard.

39. *Large yellow Newark pippin—Yellow pippin—French pippin of Newark*, c. "Abounds near Newark, New Jersey; an excellent winter apple, of a greenish colour outside, rich saccharine taste, yellow substance, and of a higher flavour than the Newton pippin. It is so abundant in juice, that a barrel of cider has been made from seven bushels; but the cider is not of the first quality. It is said to have been imported from France." (Mease.)

40. *Maiden's blush.* "This is an apple of large size, and great beauty; exhibiting a lively contrast —a yellow ground, with a bright red cheek; whence it derives its name, given to it by Samuel Allison, esquire, late of Burlington, who first brought it into notice: the form is flat; the skin smooth; the flesh white, tender and sprightly; remarkably light, and fitted for drying, for which it is preferred to any apple of the season; the stalk is short, and grows in a deep hollow, as does the eye: the fruit ripens in August, and continues in perfection till the end of September; and is fit both for pies and the table. The tree is uncommonly handsome, as well as vigorous in its growth; forming a fine open and spreading head: it bears abundantly and constantly, and is a very popular apple in the Philadelphia market." (Coxe.)

41. *Michael Henry.* "A winter fruit; a long green apple, much admired for the table, in Monmouth county, New Jersey. It is a sweet, juicy, sprightly and well flavoured apple."

42. *Monstrous pippin*, or *American gloria mundi.* "It originated on the farm of Mr. Crooks, near Red Hook, in New York. It is of a yellow colour, when ripe, and resembles in flavour the fall pippin, or piplin. It will keep from November till March. The fruit of the original tree weighed twenty-seven ounces." (Mease.)

43. *Morgan apple.* "Ripe in October. So named by Samuel Coles, of Moorstown, New Jersey; as it came from the late I. Morgan. "A pleasant eating apple; will keep till May. A great bearer." (Mease.)

44. *Newark king apple.* "Is a very large red fruit; ripens in October, and, when mellow, has a very pleasant taste, and is generally used as a winter apple about Newark, New Jersey, though it does not keep so well as some others."

45. *Nonsuch.* This is a fine red apple, having an agreeable flavour; will keep sound till late in the spring, and is much esteemed in Massachusetts, for its good properties.

46. *Nursery apple.* "Is the size of the Harrison apple. When first ripe it is of a greenish colour, but in the latter part of the winter, it turns yellow. It is frequently kept until June and July, and has been kept sound until September. It originated in a nursery of Jos. Baldwin, at Cranetown, New Jersey." (Mease.)

47. *Pearmain*, c. The winter pearmain is among the first cultivated apples by the fathers of the old Plymouth colony, and is, undoubtedly, of English descent. Many trees of this kind are now supposed to be more than one hundred years old, and grafted trees from them produce the genuine fruit in great perfection. The tree is tall and upright, forming a handsome regular top: it is hardy, and will flourish in a light soil. It is not an early bearer, but when attained to about twelve years, from having been grafted, it produces more abundantly

and uniformly than any other kind within our knowledge. The fruit is scarcely excelled as a table apple, or for cookery; and the cider, made from it, is said to be inferiour to none. The apple is of a moderate size; fair and smooth; of a reddish colour, interspersed with green and yellow; the flesh a rich yellow; the flavour slightly aromatick, and agreeable. There are two or three varieties of this apple, but rather of an inferiour quality.

48. *Pennock's red winter.* A large, fair, pleasant, spicy apple; of an oval, and somewhat flat form; of a reddish colour. It originally came from Jos. Pennock, of Springfield township, Delaware county. The tree grows large, and is very handsome; a great bearer, and the fruit is in great repute in the Philadelphia market.

49. *Priestly.* "Keeps from December to April; originally cultivated in Buck's county, Pennsylvania. A large, long, juicy fruit, and of a spicy flavour; colour red. This tree grows very straight, and is of a handsome shape." (Mease.)

50. *Pove-shon*, c. "Is a small red apple; ripe about the latter end of September; of a pleasant flavour, and makes good early cider; for which purpose it is generally used about Newark, New Jersey." (Mease.)

51. *Pound apple.* "This is a large fair apple, very showy; the form is flat; the stalk short, and planted in an indented cavity: the skin is smooth, a pale yellow, inclining to a green, streaked with a lively red; the flesh of a yellowish cast, mixed with a small portion of green; juicy and sprightly; well fitted for cooking; it ripens in October, and keeps for several months: the tree is large, vigorous and spreading." (Coxe.)

52. *Quince apple.* "The tree is of large and vigorous growth; the size of the apple is large; the shape flat; the skin, when fully ripe, is yellow; the flesh rich, yellow and juicy: in appearance, it some-

what resembles a large yellow Newton pippin. It came originally from the state of New York. Ripens in November." (Coxe.)

53. *Queen apple.* (Summer queen.) "The summer queen is an apple of the finest quality, and its appearance is uncommonly beautiful. The size is large; the skin has a fine, rich, yellow ground, mixed with red, handsomely striped and clouded, sometimes in a proportion greater than the yellow; the blossom end is much pointed, and full of little furrows and protuberances; the stalk is long, and planted in a deep cavity, with projections of the flesh around the stalk, like the Roman stem; the flesh is rich, yellow, and highly scented; equally suited for eating and stewing. It is not fully ripe until the beginning of August, but can be used for stewing long before that time: the tree is of a very luxuriant growth, with large leaves, and hanging boughs; it is a great and constant bearer: it is known by the name of sweets harvest, in many parts of New Jersey." (Coxe.)

54. *Rariton sweeting*, c. "Rich flavour; egg-shaped; makes good cider, which keeps well: brought from Rariton, by Mr. Ogden's father." (Mease.)

55. *Red everlasting.* "Ripe in November; its colour deep red; it is a small sized fruit, of tolerable flavour; and keeps well till June or July, but grows mealy and dry." (Mease.)

56. *Redling.* "Was brought, about sixty years since, from Pennsylvania to New Jersey, by the mother of Mr. Jos. Cooper, who thinks it is the best keeping apple now known. The colour is of a light, shining red, and of very pleasant smell and taste. They hang on well, being suspended at the end of a twig. It somewhat resembles the Priestly apple." (Mease.)

57. *Red streak*, c. "Originally from England; a winter fruit; keeps well, but shrinks; of a plea-

sant flavour; red with spots, and generally has a russet coloured teat on the lower side. The tree grows straight. When used for pies, they need not be pared. The cider from this apple is much admired." (Mease.)

58. *Rambo.* From Delaware; a fine apple, of the size of the vandevere; same shape, and a highly valued fruit.

59. *Roane's white crab*, c. "This apple I procured from colonel John Roane, of Virginia: the original tree was discovered a wilding on his estate, in the year 1790. In growth, it resembles the Hewes crab; the leaves being very delicate, the wood hard, and the size of the tree small: it is an early and great bearer every second year: the apple is very small, not larger than the Hewes crab; the form is round; the stalk thin; the skin yellow, with a small portion of russet about the stem, and spots of red scattered over it: the flesh is rich, dry, and of a musky sweetness; rough to the taste, from its astringent and fibrous properties, and leaving the pomace undissolved, after pressing: the liquor is remarkably strong; of a sirupy consistence when first made, but becoming singularly bright by proper fermentation and racking. It will keep perfectly sweet, in casks well bunged, and placed in a cool cellar, through our summer months: the fruit ripens in September and October, and may be kept without rotting, for late cider." (Coxe.)

60. *Rhode Island greening.* This is a fine large fair fruit; of a green colour, when first gathered, and turns yellow towards spring. The flesh is rich, juicy, tender and very yellow. It is a most excellent apple for the table, in the first part of winter, and will keep and retain its flavour till March. The tree grows rapidly, spreading its luxuriant branches very extensively, and inclining towards the earth. It is doubtful whether this is the same, or a different variety from the Jersey greening.

61. *Roman stem.* "This apple was first propagated in the neighbourhood of Burlington, New Jersey, where the original tree is now standing. It is an excellent early winter fruit, much admired for its tender, mild, juicy and agreeable properties: the size is small; the form round; the stalk of singular appearance, from a fleshy protuberance of the neighbouring part, resembling an aquiline nose; whence the apple derives its name: the skin is rough; the colour yellow, with black clouds and spots: the tree is of handsome and vigorous growth, with long shoots, and great fruitfulness: it is in every respect deserving of extensive cultivation." (Coxe.)

62. *Royal pearmain*, c. "Is a fine large apple; rather flat in its form; of a rich russet colour, blended with red, faintly streaked, and dotted with spots of russet. The skin is rough, the flesh a rich yellow, of a very sprightly taste, and firm in its texture: when first gathered, rather tart, but becomes both sweet and tender by keeping: it is a good table apple, and makes excellent cider: the size that of a vandevere: it ripens in October, and will keep till February and March: it is highly esteemed by the planters in Virginia, whence I procured it, from the neighbourhood of Richmond: the tree grows tall and straight, with a luxuriant foliage, and regular form, and is a most abundant and uniform bearer. This apple is known in Pennsylvania, and much cultivated, under the name of the Merrit's pearmain." (Coxe.)

63. *Royal russet*, or *leather coat.* "This is an apple of moderate size, and of a flat form: when ripe, the side next the sun is a rich red, intermixed with russet, with spots of white: the flesh is well flavoured, sprightly and tender; the stem short and thick, with small swellings in the surrounding parts: it is a fine cooking apple; keeps well; and bears abundantly. It was imported from England, where it is highly esteemed as a valuable winter apple." (Coxe.)

64. *Roxbury russeting*, c. This is one of the best known, and most valuable fruits in Massachusetts. The apple is rather flat, and the colour a yellowish russet: it is not fit to eat till February, and is very easily preserved till June, when its juice and flavour are peculiarly pleasant. The trees are the most constant to bear, and seldom bear so full as to break the limbs; and the fruit is excellent for cider; and for the table, late in the spring. But the trees require a moist situation, and are less likely to thrive well in a dry soil, than any other kind of apple. They require also more manuring and care than most others, or the fruit will be very ordinary.

65. *Ruckman's pearmain*, or *golden pearmain*, c. "Called in New York and East Jersey, the Ruckman's or Dutch pearmain; and in other places, the red russet; is a most valuable apple for cider, and for family use: the size is middling; the form rather flat; the skin rough, with a large portion of bright russet, mingled with red, towards the sun, when fully ripe: the flesh is rich, tender, and rather dry: it is a great and uniform bearer: the tree grows luxuriantly, with strong shoots, and a close, compact head: the fruit ripens in November, and keeps well through the winter." (Coxe.)

66. *Seek no further*. "This apple is a native of one of the eastern states: it is a large fruit; of round, but oblong form; the skin smooth, of a yellowish green colour; the flesh yellow, juicy, rich and tender; an agreeable early winter apple. The tree bears well; the trunk straight and tall, shooting into branches upwards, in a handsome and regular form." (Coxe.) The *seek no further*, or by some called *signifinger*, is much cultivated at Raynham, county of Bristol, where it probably originated. From its high reputation, it is now extending, by engraftments, into various parts of Massachusetts.

67. *Spitszenburgh.* "Keeps from November to March. There are three sorts: The Esopus; Flushing; and the Newton. The first, of a light red colour, round form, pleasant flavour, and slightly acid. The second is generally larger, and of a deeper red colour, covered with small white specks; its form is flatter, and it is of a more acid taste than the first. The third species resembles the second in taste and colour, but in form is much flatter. According to Mr. S. De Witt, surveyor general of New York, the Spitszenburgh was discovered as an accidental production, in the neighbourhood of the city of Albany, and in his opinion, may challenge the world to match it. The flavour he thinks superiour to the Newton pippin. Mr. Cooper and Mr. Coles, of Moorstown, New Jersey, mentioned another kind, called the Cane Spitszenburgh, from a family of that name near Gloucester Point, New Jersey, and which they thought superiour to the kinds mentioned above." (Mease.)

68. *Spice apple.* "Is a large autumn apple, of an aromatick flavour, very tender, and good for house use, but will not keep long. It appears to be peculiar to New Jersey."

69. *Styre*, c. This is the most celebrated and extensively cultivated cider apple in England; and is also a good eating apple. The size is above middling; the colour of a pale yellowish white; the flesh is firm, and when fully ripe, of a fine flavour: the cider, when produced from a light, rich soil, is rich, highly-flavoured, and of a good body; its price in England is frequently fourfold of that of common sale cider: the fruit is pale-rinded, but produces a high-coloured liquor. The tree is of a singularly beautiful growth, remarkably besom-headed, throwing out numerous straight luxuriant shoots, growing upwards from the crown, in the

form of a willow pollard, running much to wood, and, in deep soils, growing to a great size before it becomes fruitful. It suits sandy ground. By the end of September it is ripe in England; generally the middle of October, in common years, the time of gathering. By Mr. Knight's experiment, the must outweighed all others, except that of a new variety produced by mixing the Lalham green and Siberian crab. Marshall states, that nearly one third more of Styre apples is required to produce a barrel of cider, compared with common apples." (Coxe.)

70. *Summer pearmain.* "This is one of the finest fruits of the season; frequently preferred to a fine pear. The size is middling; the form oblong, uniformly regular; the ends both deeply indented; the colour in the shade is dull red, somewhat streaked, and faintly spotted; in the sun it is frequently of a lively red, blended with a rich yellow: the juice is abundant, until too ripe; the flesh is singularly tender; it frequently cracks open on the tree, and bursts from its own weight, in falling: it is equally adapted to the table and stewing, and is probably the most popular apple of the season, which commences with the first of August, and (it being very free from rotting) continues through that and the following month. The tree is of a moderate size; the head very round and close: it grows remarkably well on light and sandy soils." (Coxe.)

71. *Swaar apple.* Keeps from November to March. A large, yellow, and greenish apple, of good flavour; much admired as being a winter table fruit, of superiour excellence. The trees bear largely.

72. *Sweet greening.* A large, handsome apple, resembling in size and form, the Rhode Island greening. Ripens in autumn, and possesses the valuable property of retaining its soundness and fla-

vour till the middle of June. It is an excellent apple for baking, and deserves to be more extensively cultivated. Its origin is uncertain, and it is doubtful whether this fine fruit is known out of the old Plymouth colony.

73. *Tolman sweeting*. I have not been able to trace to its origin this justly admired apple. In Dartmouth, county of Bristol, where it is best known, it is held in much estimation for family use during the autumn, and through the winter. The fruit is above the middle size, yellow, with a small bluish stripe on one side: it is juicy, and the flavour pleasant.

74. *Vandevere*, c. "Formerly called stalcubs. A well known and most excellent eating fruit; pleasant, and sprightly acid, joined with a sweetish taste, and much preferred for pies and sauces. Unfortunately the trees have greatly failed of late. On a rich heavy soil, they are subject to the bitter rot; on a light soil, not so much so. Mr. Riley, of Marcus Hook, says, this apple originally came from Wilmington, Delaware, and was called after a farmer who raised it." (Mease.)

75. *Vanwinkle*, or *grunniwinkle*, c. "Is a large, red, and very sweet apple; rich taste, and fine flavour: ripe about the middle of October, when the fruit falls, and decays so rapidly that it is difficult to preserve the apple till the proper time for making first rate cider. These apples answer best, when mixed with half their quantity of the Harrison apple. Cider made from this apple alone, resembles unfermented metheglin, and must remain in the barrel until the next summer, when it will fine. The tree originated in the orchard of Thomas Williams, deceased, according to Mr. Hillyes, of Orange; but Mr. John Ogden, of Newark, says, he was told the first graft was taken from a tree belonging to an old lady, Mrs. Van Winkle Poveshon." (Mease.)

76. *Wine apple*, c. "An uncommonly large, fair, handsome, red apple. The form is round; flat at the ends: the skin is a lively red, streaked and spotted with a small portion of yellow; the stalk end frequently of a russet colour; both ends deeply indented; the stalk very short: the taste is rich and pleasant; an admired table fruit, and excellent for cooking, as well as for cider: it ripens in October, and keeps well through the fall and winter. The tree is uncommonly large and handsome; the leaves small; it bears abundantly; from its spreading form it does not require much trimming: it is probably as saleable an apple as any sold in the Philadelphia market. In the state and county of Delaware, it is called the Hays winter; and in one place in New Jersey, the fine winter, and large winter red. I have been informed, that the original cultivator of this apple made admirable cider, by throwing about one shovel full of sandy loam into a pressing, which had an effect in lessening the acidity, and made a clear, sweet liquor, by this novel mode of fining." (Coxe.)

77. *Wine sap*, c. "An autumn fruit, of a deep red colour, and sweet, but not sprightly taste; makes excellent cider, which is preferred by some to that of the red streak, cultivated by Samuel Coles, of Moorstown, New Jersey."

78. *Yellow sweeting*, c. "A large, yellow, sweet apple; will keep till harvest; makes good cider, and answers for family use. Mr. J. Ogden's father took the scion from an old tree of J. Johnston's, at Connecticut farms, fifty years ago." (Mease.)

CIDER.

I HAVE now the satisfaction of presenting the most ample and approved rules and directions relative to the important art of manufacturing and preserving that valuable and salubrious beverage, the produce of our orchards. The importance of the subject will justify the extent and minuteness of detail which occupy the following pages, and it is hoped the reader will find them, in the perusal, interesting and profitable.

"The value of fruits, for the manufacture of cider, may be judged of from the specifick gravity of their expressed juices. The best cider and perry are made from those apples and pears that afford the densest juices; and a comparison between different fruits may be made with tolerable accuracy, by plunging them together into a saturated solution of salt, or a strong solution of sugar: those that sink deepest, will afford the richest juice."

The first authority of which I avail myself, is to be found in papers on agriculture, by the Massachusetts society for promoting agriculture, vol. I.

"OF MAKING AND MANAGING CIDER.

"From the apple, in our country, we obtain a beverage highly useful. The wines of other countries do not differ more in quality, than the cider of ours. And much of this difference arises from improper management, either in grinding the apples, or, what is more common, putting the must or juice into foul casks, and neglecting or mismanaging it while fermenting. Mr. Marshall asserts, that a gentleman in Herefordshire, (England,) Mr. Bellamy, produces cider from an apple called the Hagloe crab, which, for richness, flavour and price on the spot, exceeds perhaps every other fruit liquor, which nature or art have produced. He has been offered sixty guineas for a hogshead of one hundred and ten gallons of this liquor. Thus we see how capable the fruit from the apple tree is of improvement. We are favoured with the observations of a gentleman residing near Philadelphia, on the making and fermenting cider, and his directions to preserve the casks that have been used for cider. He begins thus: 'It would be to little purpose, at present, to say much on the kinds of fruit capable of yielding the best cider, yet it may be proper to mention those most common here, and give them a place according to their respective merits. The sweet russet, called the pair apple, is unquestionably the richest fruit we have: the house apple stands second: they both yield very sweet must, and consequently, specifically heavier than that of any other apple. The Newton pippin yields its must free from the finer pumice, and, although not so rich, from that circumstance, ferments more moderately, and is soonest fine in the cask. The Spitszenburgh and pearmain I do not rank among the cider apples, because they seldom afford a must that will bear fermentation, except the season be *uncommonly dry*, or the trees *very old*. The largest and finest fruit grows on young trees, and in moist seasons, and these yield the greatest quantity of cider. Old trees and dry seasons afford a smaller fruit, highly flavoured, and less juicy. The vandevere is little better than good water cider. If it be fermented, it very soon becomes acid, and if not fermented, becomes ropy. The red streak, the cockagee, and the royal wilding, so famous in England and Ireland, are not known here, but the Virginia crab well enough supplies the place of them all. This apple deserves every possible attention, as its must is less disposed, from its great acidity, to rise too high in fermentation, than that of any apple known here. Were there no other advantages, this simple one would render it exceedingly valuable to the common farmer, who will be hardly brought to pay attention to the nice operation of fermenting the sweeter fruits; but it has almost every other good property of a cider apple. The trees bear abundantly, the fruit ripens late, and is free from rot of any kind; the fruit is small and hard, and therefore bears the fall from the tree without bruising. It grinds small, and the pulp is remarkably tough, yet parts with its juice readily; hence the must runs from the press very fine. It would be going beyond my present object, to say much more of this apple; yet I cannot forbear observing, that being acid, it will bear to stand in the pumice longer than any sweeter apple. This fact deserves more attention than is commonly given to it; and if the time and occasion would admit, I should indulge myself in speaking largely on it.'

"As the inquiry is how to make the *best cider*, there need not any thing be said of imperfect fruit, or that which falls from the tree early in the season, as they cannot be applied to this purpose; the September gale beating down such great quantities of apples, tempts the farmer to use them with those that continued longer on the tree. But where this gale happens early, the effects are fatal to the cider: for, if they are made up immediately, the fermentation rises too high, in consequence of the too great degree of heat in the air; and this evil is increased by the *imperfect* and *great* quantity of juice contained in the fruit; if they remain unground, they become insipid, especially those which lay on the ground under the trees; and if gathered in heaps, they are disposed to rot. To make the best cider, you must have sound fruit, gathered late in the season, in dry weather, after the middle of October, if possible. They should lay in large heaps, covered from the dews and rain, about fourteen days; in which they heat, and throw off a great proportion of their indigested and insipid water, and ripen more uniformly than while on the tree. They must not be ground while they are wet, either from the rain, the dew, or from the moisture thrown out by the heat produced by their laying together. The finer the apple is ground, the more it will yield. If the mill is well fitted, it crushes the seed, and gives a peculiar aromatick bitter to the must, which becomes more and more distinguishable as the cider is longer kept. Some prefer this flavour; others dislike it, not distinguishing it from the bitter of the rotten apples, although very different from that pungent bitter, both in taste on the palate, and effects in the stomach. If straw is used in forming the cheese for the press (cloth made of hair is best, but very expensive) it must be clean from *rust;* for there is no liquor which more readily imbibes and betrays offensive tastes than cider. Too hard pressing on the cheese, before it is sufficiently closed, presses out the pulp with the must, and it is in all cases necessary to return the first running on to the cheese, until you perceive it free from pulp. If you choose a pale cider, the pumice must be pressed as soon as possible from the mill: the colour is raised by exposing it longer, and in greater surfaces to the air. The aptness in cider to imbibe foreign tastes, renders an exact attention to your vessels of great importance. New vessels, made of seasoned oak, do very well; but those that have been used are better, provided they be kept *sweet* and clean. To effect this, when a cask is empty, rinse it with cold water immediately, otherwise the lees will sour, and fix an acid that can hardly be removed; and if long continued, dries on the staves so hard as to require much labour in scrubbing it off: in this case, it should be white-washed with lime, and after a few days washed again; when it is rinsed *perfectly* clean with cold water, pour into a hogshead at least six gallons of boiling water. Roll and shake the water to every part of the cask, so as to heat it on all sides. Then pour out the water, and lay your cask exactly bung-hole downwards, the water running clear and entirely off; the heat in the cask will dry it perfectly. In this state, bung it up as carefully as if filled with your choicest liquors, and it will remain perfectly sweet, and fit for use in the following season. It is best, however, to inspect each cask before you fill it. This is done by fixing a candle to a wire three feet long, and letting down the candle through the bung-hole into the cask; you can then see every part of it on the inside as distinctly as on the outside. If they are clean, it is *best not* to rinse them with water. It may appear singular to you that so much is said on a case that is plain to every one; but believe me, you may take ten times the trouble in another way, and not effectually cleanse your vessels; and unless they are perfectly *sweet*, it is impossible to have good cider. The must, or juice of the apple, being obtained, the first object is to clear it of pumice: the second, to produce a fermentation to your palate and purpose.

"The most expeditious mode of doing the first in the great way, is by putting the must in large open vessels, there to stand until the first appearance of fermentation.* This comes on sooner or later, from circumstances too various for our present consideration at large. It may serve the purpose to consider the operation, as dependent on the degree of heat in the air at the time: perhaps sixty hours is long enough to be wished for. During that time the *heaviest* of the pulp sinks to the bottom; the

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[*] Hogsheads, or even barrels, answer very well with a head out, where there are plenty of casks; but it is as well done in the casks you intend to ferment in, provided you attend to the first appearance of fermentation at the bunghole, and remove the pulp entirely out of the cask.

larger and lighter parts rise to the surface, where it remains until the fermentation begins; but the fermentation would involve great part of the pulp, both from above and below, into the body of the liquor, and increase the fermentation beyond our control. It must therefore be removed before this effect be produced. Soon after the fermentation begins, the covering on the top of the *must* cracks and separates, when there is not a moment to be lost before you draw it into your casks, leaving the pulp behind. In this cask it undergoes the first of the fermentation for eight or ten days; but before this *most difficult part* of the *art* of making the *best cider* can be well understood, there are so many points to be considered of, that I have always hesitated to give my opinion of it, from a certainty that the subject would become tedious beyond sufferance. There are, however, a few obvious principles of great importance, which may be borne with.

"Cider requires a very gentle fermentation, and ought to be confined between forty-four and forty-eight degrees of heat (by Fahrenheit's thermometer.) Musts, of all kinds, increase their heat by fermentation. Liquors, of all kinds, will not be colder than the air in which they stand. It is easy to comprehend, if these are facts, the impossibility of making *good cider*, when the medium heat of the day exceeds forty-eight degrees. I say the *medium heat of the day*, because our best cellars being fifty degrees of heat in the latter end of October, renders them, generally, unfit for fermenting cider, and involves a necessity of having your first fermentation above ground, where the heat of the day will have its effect. Hence the known fact that cider ferments most kindly in the shade, on the north side of your buildings, wherever the cool nights of the fall reduce the medium heat of the day below forty-eight degrees. During the first fermentation abovementioned, attention must be given to it, that, in case of rising above forty-eight degrees, it should be racked off early in the morning, (before sunrise, if the weather be warm for the season;) this racking checks the increase of heat occasioned by the fermentation: but in late made cider there is seldom a necessity of racking in less than eight or ten days; at which time there will be a considerable quantity of lees fallen to the bottom of the cask, from which the cider should now be removed.

"If the air in the cellar be fallen to forty-six degrees, or below, you may place the cider in it, leaving, however, the windows and doors open in the night, until the air becomes as low as forty degrees, (the heat, in my judgment, best for cider during the winter, provided it could be had without artificial heat, which is too difficult to manage, to be applied in cellars.)

"The earlier made cider, checked in its fermentation by water from time to time, becomes soon fine, and is a very pleasant drink. That made later, and checked in the same manner, with the proportion of one fourth water, is soonest fine, and, during the winter, is not inferiour to the best cider unmixed.

"During the whole time of fermentation the casks must be kept full, so that the yeast, pulp gas, or whatever you please to call that matter which rises in fermentation, may be thrown out of the cask, and not return into the liquor: for if it does, it operates as yeast, renews the fermentation, and will destroy the cider.

"In about five weeks after the first racking, it should be again racked, taking care to draw off none of the lees. The bungs may be left out a *month* longer without any ill consequence, or at most laid lightly on the bung-hole, when it may be proper, if the fermentation is ended, to bung it down; in a few weeks it will be fine spontaneously, provided the fermentation has been well conducted. If any part of the process has been injudicious, or unavoidably wrong, and the cider be not fine by the 20th or 25th of February, it should be forced with isinglass. But let me warn you not to attempt fining it after the 20th of March, unless your cellar be uncommonly secured from air. For the spring will as certainly produce a motion in your cider, as blossoms on the trees; at which time glutinous finings, retaining the air produced or separatby this new fermentation, will be either retained from falling down in the cask, or borne to the surface of the liquor. Three staples of isinglass, dissolved in cider, is sufficient for a hogshead. It should be pulled into small pieces, and covered with cider in an earthen vessel, adding a quart of cider to it every six hours, till it is dissolved; stirring it frequently. When dissolved, which it will be in two or three days, strain it through a coarse cloth; add a gallon or two of cider, and pour it into the cask, 'stirring the whole together with a stick. Leave the bung out; it will generally fine in four or five days. It must not remain above ten or twelve days at most on the finings; if you do not bottle it, it must be racked again into other casks; the bottles must be dry; three drops of water will destroy a bottle of cider, after it has been well fermented, more effectually than a pint will before it is fermented.

"In corking cider, or other weak liquors, no water should touch the corks; dip them in cider the moment in which you drive them; they will drive the easier for this. If cider is to be kept in casks after May, early in the spring cover the bungs with rosin, or cement of some kind: to do this, open a spile hole while the cement is laid on; otherwise no art can cover the bung effectually: the air from within will force up the cement through the smallest passage, and disappoint a thousand attempts to fill it up: when covered, and the cement cooled, make the cask tight by driving an oaken spile into the hole. Inferiour cider, for the harvest field, is kept by adding a gallon of cider brandy to a barrel. The method I have directed above, produces a fine sweet cider, retaining the taste of the apple. More frequent racking weakens the body and preserves the sweetness; fewer rackings, and laying long on the lees, renders it harsher and more heady. If cider be *well fermented* in *due time*, you may freeze it down to any strength; taking care to draw it off before a thaw comes on. If cider be imperfectly fermented, the spring produces the fermentation anew, and it will destroy itself, unless preserved by distilled spirits, or by brimstone, which last is too offensive to be used."

The following is extracted from Willich's Domestick Encyclopedia.

"The apples should remain on the trees till they are thoroughly ripe, when they ought to be gathered with the hand, in dry weather, that they may be protected both from bruises and from moisture. They are are then to be sorted, according to their various degrees of maturity, and laid in separate heaps, in order to *sweat*; in consequence of which they greatly improve. This practice, however, appears to be useful only for such fruit as is not perfectly ripe, though some recommend it as being proper for *all* apples. The duration of the time of sweating may be determined by the flavour of the fruit, as different kinds require various lengths of time; namely, from eight or ten days to six weeks. The harsher and more crude the apples are, the longer it is necessary that they should remain in a sweating state, and not only be well dried, but the rotten parts carefully pared, before they are exposed.

"The utility of the sweating practice is acknowledged in all the cider countries, though various methods have been adopted in following it; as the apples are piled up either in the open air, or under cover in houses. In the South-hams, a middle way has been adopted, to avoid the fermentation occasioned by piling them up in houses, and which we recommend as the best, and most rational. Heaps of fruit are raised in an open part of the orchard, where, by means of a free air and less heat, the desired maturity is gradually effected, with an inconsiderable waste of the juice and decay of the fruit, which thus becomes almost totally divested of rancidity. And, though a few apples will rot, even in this manner, they are still fit for use: all of them continue plump and full of juice, and heighten in a considerable degree the colour of the liquor, without imparting to it any disagreeable smell or taste.

" The fruit is then to be ground till the rind and kernels are well bruised; a process which will considerably improve the flavour and strength of the liquor, when it should be allowed to stand a day or two in a large open vessel. It is next pressed between several hair-cloths, and the liquor received in a vat, whence it is removed into casks, which ought to be placed in a cool situation, or in the free air, with their bung holes open. These casks are to be sedulously watched, till the cider *drops fine*, when it is to be immediately *racked off* from the lees into other vessels. The first *racking* is a most important operation; as cider, which is suffered to become foul again, by missing the first opportunity of racking it when fine, will never become what is called a *prime* liquor. After the clear part has been racked off, a quantity of lees or dregs remains, which, when filtered through coarse linen bags, yields a bright, strong, but extremely flat liquid: if this be added to the former portion, it will greatly contribute to prevent fermentation, an excess of which will make the cider thin and acid. To avoid such an accident, the casks should neither be entirely filled, nor stopped down too close; and if the whole incline to ferment, it ought again to be racked. This latter operation, however, should, on no account, be repeated, unless from absolute necessity; as every *racking* diminishes its strength.

"When there are no signs of any farther fermentation, the casks should be filled up with cider of the best quality, and the bung hole firmly closed with rosin.

"This method of making cider is that chiefly followed in Herefordshire. Considerable quantities of this liquor are also made in Devonshire, where the process varies but little from that pursued in the county beforementioned. Several farmers, however, instead of racking, *fine* it with isinglass steeped in white wine, dissolved over the fire, and then boiled in a quantity of the liquor intended to be fined: in this state, it is added to that in the cask. Others, instead of dissolving the isinglass over the fire, digest it in white wine for the space of four or five weeks, during which time it acquires the consistence of a jelly; a quantity of this being beaten up with some of the liquor, the whole is worked into a froth, and mingled with the rest. As soon as the cider becomes clear, it is drawn, or bottled off, as occasion may require.

"Those who are anxious to prepare good cider, ought diligently to watch every change of the weather, however slight; as the least neglect, at such times, is often detrimental to many hogsheads. In summer the danger is much greater than in winter. There is, however, scarcely any distemper incident to this liquor, which may not, by a timely application, be easily remedied. If it become somewhat tart, about half a peck of good wheat, boiled and hulled in a manner similar to rice, may be put into each hogshead, which will effectually restore it; and also contribute to preserve it, when drawn out of one cask into another. Such a remedy is doubtless far preferable to that odious custom practised by too many cider merchants, who put animal substances into their liquors, namely, veal, pork, beef, mutton, and even horse flesh, for the purpose of fining them. This singular expedient, though sanctioned by the usage of ancestors, we think it our duty to reprobate; because it is fraught with mischievous effects on the constitution of those, who are doomed to drink the cider thus adulterated. By allowing a small quantity to stand in an open vessel for two or three days, in a warm room, the fetid exhalation of the liquor will easily discover its ingredients.

"The best cider is that made from a red-streak apple, grafted upon a gennet-moil stock. These two varieties of the apple tree agree well together, and their trunks seldom canker, as others are apt to do, especially when the former is grafted on crab trees. The fruit of the red streak, obtained from the former combination, is always larger and milder; and when ripe, not only most delicious eating, but also affords a mellower liquor than the same fruit produced by the latter mixture."

"There have been," says Dr. Mease, (Dom. Ency.) "numerous receipts published to make cider, some of which have occasioned considerable losses. A few general and important rules will be given for insuring good cider, and afterwards some particular directions, founded on experience.'

"1. The first and indispensable requisite for making good cider, is to choose perfectly ripe and sound fruit. Farmers, in general, are very inattentive to these points, but it is utterly impossible to make good cider, unless they be attended to.

"2. The apples ought to be hand-picked, or caught in a sheet, when the tree is shook. When they fall on the ground, they become bruised, and as it frequently happens that they remain for some hours before pressing: the apples are apt to communicate a bad taste to the liquor from the bruised part.

"3. After having sweated, and before being ground, the apples should be wiped, in order to remove a clammy moisture which covers them, and which, if permitted to remain, would impoverish the cider.

"4. The practice above noted, to press the pumice in hair-cloths, is certainly much preferable to the common American custom of enclosing it in bands of straw; because the straw, when heated in the mow or sack, gives the cider a bad taste.

"5. After the cider has run from the press, it has been directed to strain it through hair sieves into a large open vat, which will contain a whole making, or as much as can be pressed in one day. When the cider has remained in this vat a day, or sometimes less, according to the ripeness of the fruit of which it has been made, and state of the weather, the pumice, or grosser parts of the pulp, will rise to the top, and in a few hours, or after a day or two at furthest, will grow very thick, and when little white bubbles break through it, draw it off through a cock or faucet hole, within three inches from the bottom, and the lees may quietly remain behind. This operation is of great importance, as the sinking of the feculent matter would greatly injure the liquor.

"6. On drawing off the cider from the vat, it must be tunned into clean casks, and closely watched, to prevent the fermentation; when, therefore, white bubbles, as mentioned above, are perceived at the bung-hole, rack it again immediately; after which it will probably not ferment until March, when it must be racked off as before, and, if possible, in clear weather.

" 7. It is of great consequence to prevent the escape of the *carbonick acid*, or fixed air, from cider, as on this principle all its briskness depends. To effect this, various expedients have been contrived. In the state of Connecticut, where much cider is made, it is a common practice to pour a tumbler of *olive* oil into the bung-hole of every cask. Upon the same principle we have lately heard of a man, who boasted that he had drunk brisk beer out of the same cask for *five* years, and that his secret was to cover the surface of the liquor with olive oil. Dr. Darwin also says, he was told by a gentleman who made a considerable quantity of cider on his estate, that he procured vessels of stronger construction than usual, and that he directed the apple juice, as soon as it was settled, to be bunged up close, and that though he had had one vessel or two occasionally burst by the expansion of the fermenting liquor, yet that this rarely occurred, and that his cider never failed to be of the most excellent quality, and was sold at a great price.

" To prevent a succeeding fermentation, put in a handful of powdered clay; and to preserve it, add one quart of apple brandy to each barrel. Every cask must be filled up and closely bunged.

" 8. When care has been taken to prevent the precipitation of the feculent matter which rises in the cider, good liquor will generally fine without artificial means; but sometimes it is necessary to fine after the last racking, when the abovementioned article has been found to answer very effectually, if used in the following way. For a barrel, cut one ounce of isinglass fine, put it into a pint of water, stir it frequently, and make a thick jelly. Dilute this with cider, strain and mix it well with the liquor in the cask, by means of a long clean stick.

" The editor has known an ounce of *orris root*, in powder, give a pleasant flavour to cider.

"A friend directs cider to be bottled in July, to fill the bottles within two inches of the top, letting them stand twelve hours open before corking. Use strong porter bottles, and the best velvet corks. The bottling should be done in clear weather.

"For the following communication on the making and fining of cider, the editor is indebted to Joseph Cooper, esquire, of New Jersey.

"'Cider is an article of domestick manufacture, which is, in my opinion, worse managed than any in our country: perhaps the better way to correct errours is to point out some of the principal ones, and then to recommend better plans.

"'Apples are commonly collected when wet, and thrown into a heap, exposed to sun and rain, until a sourness pervades the whole mass, then ground, and for want of a trough or other vessels sufficient to hold a cheese at a time, the pumice is put on the press as fast as ground; and a large cheese is made, which requires so much time to finish and press off, that a fermentation comes on in the cheese before all the juice is out; and certain it is, that a small quantity of the juice pressed out after fermentation comes on, will spoil the product of a whole cheese, if mixed therewith. When either of the above errours will spoil cider, we need not wonder at the effect of a combination of the whole, as frequently happens. As I have very often exported cider to the West Indies, and to Europe, and also sold it to others for the same purpose, without even hearing of any spoiling; and as it is my wish to make the productions of our country as useful as possible, I will give an account of my method of making this valuable liquor.

"'I gather the apples when dry, put them on a floor under cover, and have a trough large enough to hold a cheese at once, and when the weather is warm, I grind them late in the evening, spreading the pumice over the trough to air it, as the cider will thereby be enriched, and a fine amber colour in it be produced: and here it may be remarked, that the *longer a cheese lies after being ground, before pressing, the better for the cider, provided it escapes fermentation* until the pressing is completed. The following experiment will render this evident:—Bruise a tart apple on one side, and let it lay until brown: then taste the juice of each part, and it will be found that the juice of the bruised part is sweet and rich: so if sweet and tart apples are ground together, and put immediately on the press, the liquor which they produce will have the taste of both kinds of fruit; but if permitted to lie until the pumice become brown, the cider will be greatly improved.

"'I take great care to put cider in clean sweet casks, and the only way to effect this is, to rinse or scald them well as soon as the cider is out, and not to permit them to stand with the lees, which will certainly cause them to become sour, or musty, or to smell. When my casks are filled, I place them in the shade, exposed to the northern air; and when fermentation takes place, I fill them up once or more, to cause as much of the feculent matter as possible to discharge from the bung; when a clear white froth comes out, I put in the bung loosely, or bore a hole in it and put in a spile, thereby, checking the fermentation gradually. After this has subsided, I take the first opportunity of clear cool weather, and rack it off into clean casks, which I prepare thus. When I draw cider out of a cask in which it has fermented, I rinse it with cold water, and put in two or three quarts of fine gravel, and three or four gallons of water; the cask is well shaken or rolled, to scour off the sediment always adhering to the cask, and which, if not removed, will act as a ferment to the liquor when returned to the cask, and spoil or greatly injure the liquor.

"'After scouring the casks, I again rinse them, and I find advantage from burning a match of sulphur suspended in the cask by a wire, after putting in two or three buckets of cider. A convenient way to perform this process is to have a long tapering bung, so as that between the two ends it will fit any hole; to the small end of this bung drive in a wire with a hooked end to hold the match. If the cider stands a week or more after racking, previously to being put away in the cellar I rack it again, rinsing the casks, but not with gravel, and remove them to the cellar. The late made cider I put in the cellar immediately after, or before the first racking, according as the weather may happen to be. The cider intended to be kept till summer, I rack in clear, cool weather, in the latter end of February or beginning of March; the casks must be kept full, and bunged as tight as possible.'

"Mr. Cooper fines with the isinglass jelly, mentioned above; but in case the liquor should not fine in ten days, he directs to rack it again, and repeat the fining as before, but says it is best to rack it, whether fine or not, in ten or twelve days, lest the sediment should rise, which often happens. Mr. Cooper adds, 'The foregoing operation should be performed previously to the apples being in bloom, but I have succeeded best in the winter during steady cool weather. I have likewise had good success in fining cider directly from the press; when this is done, I set the casks with one head out, but covered, put in taps, and let them remain in a cool place, properly fixed for drawing, when the fermentation ceases, and the scum begins to crack. I take it off carefully with a skimmer, and draw it from the sediment. If not sufficiently fine before the middle of winter, I fine it again, as above.'"

If the above recited details do not embrace completely the entire subject of cider-making, the following elaborate and most valuable communication from John Lowell, esquire, will supply every deficiency, and cannot fail of being acceptable. From Mass. Agricultural Repository, vol. iv.

"Some remarks on the necessity and importance of improving the manufacture of Cider, introductory to some extracts from approved English and French works on that subject. By the Corresponding Secretary."

In his introductory part, Mr. Lowell observes, that "there is nothing of which a good farmer is so proud, as of his orchard; and the state of the orchard is generally a pretty good test of the character of the man as to industry and capacity at least: Our climate and soil are well adapted to the apple tree, and it certainly is desirable, that cider should continue to be the general drink of the New England people. It is greatly to be desired that this liquor should be improved in its quality as much as possible. The quality of our cider, as it is commonly drunk, particularly in the country, is inferiour to that of any cider country in the world, and much inferiour to that of New Jersey." In the opinion of Mr. L. some of the causes of the ill quality of our cider, compared with that of New Jersey or Europe, maybe resolved into the following:

"1. Inattention to the selection of proper fruits in making our orchards.

"2. Neglect to separate the different sorts of apples, so that those only which are of an equal degree of ripeness should be ground together. What sort of wine do you suppose would be made, if the ripe and unripe grapes were all put into the same press? Is cider an exception to the common laws on this subject? How can it be expected that cider should pass regularly through the process of fermentation, when it is composed of liquor in various stages of ripeness? Some farmers, we know, are attentive to this point, and others must have felt the good effects of it.

"3. The third cause of the indifferent quality of our cider, is the process of making it.

"And, lastly, gross inattention to it, after it is made.

"I shall consider each of these points separately, and instead of showing the existing defects, I shall take from the most approved English and French works, directions on all these heads. Let our farmers read them; if they are conscious that their practice is defective on any of the points mentioned, they will have instructions how to remedy them. If they think their own practice better, let them, for the publick good, communicate that practice to the society for the promotion of agriculture, and the society will make it known.

"The first point of attention, in which we are defective, is the selection of proper fruit for making cider. I believe there is not an orchard in Massachusetts, planted on the principles laid down by writers on this subject. I believe there is no one apple selected in preference as a *cider apple*. There are trees grafted for winter fruit, but our cider generally takes the refuse of all our apple trees.

"The first work I shall cite on this subject, is a treatise on cider-making, by H. Stafford, esquire, of Devonshire, Great Britain.

"'Some are of opinion, that with good management, any kinds of apples may be made to produce good cider, but experienced farmers do not concur with them. I have, indeed, tasted of cider, made of common fruits, extremely sweet, but for want of sprightliness mixed with it, it soon palled or became sour.

"'In Devonshire, it is a maxim worth observance, that in planting an orchard, the several excellences of the kinds intended for that purpose, should be previously well considered, whether they are likely to make lasting, large, and fruitful trees, as well as hardy, not subject to blights; that they produce fruit which will make the best cider, and that all the kinds may ripen about the same time, or at least, enough at one time to make a good cheese for one pressing, which last property is of no small consequence for the making of cider.' Who among us has followed such rules, and yet who will deny they are wise?"

That portion of this excellent communication, which relates to the planting an orchard, is omitted as superfluous, since the subject has been fully considered in the foregoing pages.

"The Complete Farmer's Dictionary gives the following additional hints on this part of our subject. They are the advice of a Herefordshire planter. That county is famous for its excellent cider.

"'The worse the apple is for the table, the better it is in general esteemed for cider, such as are harsh and crabbed to the taste. They are called red streak, white and green musts, &c. &c. of all which I prefer the red streak. Generally, the redder the apple, the better it is for cider. The paler the rind, the worse the juice. A sweet apple with a tough skin will always yield a good vinous liquor. The more yellow the flesh of the apple, the better and finer coloured will be the cider. The above maxims, though few, have been of great service to me in life, but they must not be scrupulously adhered to, because there are exceptions. I seldom suffer my apples to be gathered till they begin of themselves to drop. Great care is taken in gathering, for fear they should be bruised. I have found this a very needful precaution.*

"* This is a point never, or very seldom attended to in our country. Cider apples are usually knocked down with poles, to the damage of the fruit and tree."

"'As they are gathered,' says the Herefordshire planter, 'I have them sorted according to their several degrees of ripeness.'

"The French writers are equally urgent on the importance of selecting the fruits best adapted for cider, and in planting those of an analogous or similar nature in one orchard.

"It may be said, there are great difficulties in procuring trees of approved sorts. Where can we get the Hughes's crab and Hagloe crab, and the other celebrated apples? it may be asked.

"We answer, there never will be a supply till there is a demand. It is believed that as many thousand trees of the best cider fruit can be procured annually, as will be wanted. Trees can be imported from England and France, or from New York, and sold here for thirty cents a piece. In a few years we should have nurseries here, whenever our farmers shall think it best to have the most productive apples, and those which experience has shown to be calculated to make the best cider. But while they are contented with an orchard, one half of which consists of bad fruit, some trees ripening in August, some in September, and some not ripe in October; while they are indifferent as to the quality of their cider, and esteem an acid, musty liquor as well as a vinous, well-flavoured one, no doubt good apple trees will be dear, or not to be had. It is true that we probably have many natural apples equal to the most famous of Herefordshire.

"Our climate is much better suited to the apple. Our trees are fairer and finer than those of the best cider counties in Great Britain. We must have probably some excellent native apples. But then, who knows where to get them? The reputation of an apple hardly goes beyond its village, and many farmers know nothing of the quality of their own apples, except their productiveness, because they mix the good and bad together.

"On this first point, it is apparent, that we cannot rival other countries in cider, until we adopt some system in planting, by selecting apples well known to be calculated to make good cider, and well assorted as to ripeness.

"We now proceed to the second point; the culling and sorting the apples previous to grinding them.

"That this is considered an important part of the process of making good cider, will appear from the following extracts.

"The Abbe Rosier, author of the most approved work on agriculture in France, has the following remarks.

"'The fruit ought always to be left on the trees till it is quite ripe. You may then disengage it from the tree easily, without hurting the fruit buds of the next year. They should be gathered on a dry day, when they are not covered with dew, or any extraordinary moisture. Moisture causes them soon to rot and turn black. They ought to be collected in as large heaps as possible, to ripen them better. The early apples ought to be separated from the later ones. Some will be too ripe, or even rotten,' while others are yet green. They take care, therefore, to heap together those only of the same kind. As to windfalls, they are collected separately, in order to make cider for present use. The apples ought to be gathered by hand. It should be done by light ladders, so as not to injure a single bud of the next year. The question is this, whether the slight additional expense of gathering the fruit by the hand, will not be abundantly compensated by the preservation of the fruit buds of the next year?

"'Rotten apples ought to be entirely excluded. They give a musty taste to the fruit.

"'You ought to collect all the apples of a similar sort together, having a regard both to the quality and degree of ripeness. Without this attention, you will carry to the press apples which are green, others rotten, and there will result from it a very bad liquor. On the other hand, you will have by separation, cider of different qualities, but all good. Some is good for immediate use, that is, in three months; some will keep for one or two years.

"'The Normans separate the sweet apples from the sour. This was the advice of the celebrated Olivier de Serres, the father of French agriculture. He says, Let us remark that we ought not to mix the different kinds of fruit. The sweet should not be mixed with the sour: each should be separately pressed. This will affect the goodness as well as duration of the cider. Thus sweet apples will give the best quality, and sour the second. The last will keep the longest.' Abbe de Rosier.

"Such are the opinions of French cultivators as to the sorting and selection of apples.

"The Complete Farmer's Dictionary gives us the English practice. The Herefordshire planter thus describes his operations.

"'As the apples are gathered, I have them all sorted according to the several degrees of ripeness, making in general three sorts, which a little experience teaches to separate properly, the difference being apparent at first sight. As fast as they are gathered, they are carried under a shed to ripen. I suffer my apples to lie a longer or shorter time in heaps, according to their nature; such as are hard and solid lying longer than those that are soft and pulpy. I divide my apples into three sorts, but I have six qualities of cider, each differing in taste, flavour and quality.

"'As fast as the fruit is ground (I need not say I use the ripest first) the pulp is put into vats near the press before it is put into the cheese; at the bottom of the vat is a tap, through which a considerable quantity of vinous juice will run without pressing.

"'This is the best cider, and I barrel it by itself. I then press the rest, and barrel it separately. Thus I have six qualities from my three assortments of apples.'*

"Another English writer says, 'When your apples are fit for gathering, it is essential to choose dry weather, for water is a bad ingredient in all vinous liquors, and gather it *by hand.* This is difficult in extensive orchards and on high trees, but it is of great advantage, and quits cost. You can choose your apples, and leave those that are not ripe: you save your fruit from bruises, and your trees from damage. The gathering by hand, especially for winter fruit, is so essential, that it cannot be dispensed with. Those who plead want of time, may be answered, that it would be more beneficial to them to have only half the quantity of good cider, than the whole of indifferent.

"'But for those who are too lazy to adopt this practice, the best method is to cover the ground with a sufficient thickness of straw to save the apples in their fall, and to put blankets upon the straw; then to shake the boughs gently, removing the apples under the tree at every shaking, that they may not be bruised by those which afterwards fall.'

"Now, we ask, whether this sort of care is with us ever taken? and whether it is not as well worth the pains in this country as in England? Would not half the quantity of excellent cider go as far in

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"* Would it not be worth the pains of our farmers to keep the first runnings of the press separate, and use or sell it as cider of superiour quality? There can be no doubt of the correctness of this Herefordshire farmer's remarks. He must have had the advantage of experience."

a family and sell for as much as double of an inferiour and miserable quality?

"'Windfalls, bruised apples, and unripe ones, should not by any means be mixed with those which are choice; for if they are, it will be vain to expect good cider. This bad fruit need not be thrown away. It will make a cider of inferiour quality. There is a difference of opinion as to sweating the apples in heaps, but they all agree in one maxim, that the fruit should be ground when it is in the greatest perfection for eating. Almost all apples require some time for ripening. And they should be so separated as to have each sort ground when it is perfectly ripe.' Complete Farmer's Dictionary.

"These are the hints given by French and British writers. Are they not judicious? Are these practices adopted with us? If not, why should they not be? Cider in the cider counties of England is not much dearer than with us. But the price is regulated by the quality. Cider of good repute will sell for three or four times as much as that which is indifferent. It would soon be the case in our country, if any of our spirited and intelligent farmers would adopt these rules, or any others calculated to make their cider equal to that of Normandy or Great Britain, or of Newark, in New Jersey. Let us not longer have the reproach so often bestowed on us, that while our soil and climate are peculiarly adapted to the apple tree, our cider is such, that foreigners, and even our own citizens, who have been accustomed to better liquors, cannot endure it. Hence the great consumption of brandy and ardent spirits in our country towns. Furnish them a pleasant and wholesome beverage, and you will do more to abolish this practice than you can do by any other means. We have thus seen that a second method to precure good cider in other countries is to sort and select the fruit destined to produce it.

"The third question relates to the mode of making the cider, and the last to the treatment of it, after it is made, till it is fit for the table. These two points, being intimately connected, and very much blended by the writers on this subject, we shall consider together.

"The Complete Farmer's Dictionary contains the following directions on this part of the process.

"'The first runnings from the vat may be immediately put into barrels, taking care to strain them first. As to the juice, after it is pressed, it ought to remain thirty hours in the tub or vat into which it runs, till the feces or dregs have fallen to the bottom, after which it may be drawn off by a cock and put into the barrels. After the cider has done fermenting, some persons throw two or three handfuls of wheat bran into each barrel, which serves to make the head or cream thicker, and makes the cider keep better. New casks are, if possible, to be avoided, as they give the cider a disagreeable taste; if it cannot be avoided, they should be scalded with water in which a considerable quantity of apple pulp has been boiled. If a vessel is not sweet, it may be made so by putting some unslacked lime into it, and letting it stand till the fermentation is over. A dozen sweet apples sliced into a cask of cider, have been found to be advantageous.'

"One writer says, the best cider he ever had, was when he put into each hogshead three quarts of good wheat first boiled, and hulled. The same writer says, he must give one piece of advice to cider makers, that they diligently watch the alterations in it during changes of weather. There is scarcely any disease in this liquor but what may be cured by a timely application. If it is only a little inclined to tartness, wheat, managed as above, (that is, boiled and hulled,) will cure it. The quantity, when cider is quite tart, is half a peck to a hogshead, or about a quart to one of our barrels. Such are the directions of one cider maker whose opinions are quoted in the abovementioned dictionary.

" Another writer says, when the apples are ground they are not put immediately into the press, but into wide tubs or vats, where the pumice should be turned five or six times a day, to prevent fermentation. This is done in order to give the cider a fine colour. This is done in two days. It is usual, says this cider maker, to dispose of all the liquor in the same way and without distinction. This is wrong, if there is any analogy, as there must be, between cider and wine. Experience has shown, that in making wines there is a great difference between the *first* runnings from the press, and those which are obtained by hard pressing; and this difference is always in favour of the former. If the same be true of cider, we lose by our common method the richest and choicest kinds.

" When the pressing of the apples is finished, the most careful makers of cider strain it through a hair sieve, (or through sand,) to separate it from the coarsest dregs. It must be then left to itself till it has gone through the necessary fermentation; for this purpose some put it into hogsheads, and others into great tubs or vats, wide at top, and narrower at bottom, containing from five to twenty hogsheads, or from twenty to eighty barrels. In these vessels the heaviest lees subside, and the lighter lees form a crust, which, when it begins to crack and sink, gives notice of the time to draw off and barrel the cider.

" The usual time for this first fermentation is from thirty-six to forty-eight hours. Some affirm, they can put the liquor immediately into the barrels, without any other caution than leaving space to work off the lees; but this is hazardous, and successful only in favourable seasons. A moderate degree of warmth is absolutely necessary to produce the proper fermentation of cider. If, therefore, your cellar or apartment be too cold, it must be moderately warmed. As soon as the fermentation is over, (and great care must be taken to prevent its being too great, for in this last case it will become acid,) it must be drawn off, and then it may be put where it is to be preserved. New casks are bad. Frequent scaldings with hot water, in which a little salt has been dissolved, or with hot water, in which pumice has been boiled, and afterwards washing the cask with cider, will check this evil.

"There are some who advise the fumigating casks with brimstone, and affirm that the acidity of the cask is corrected, the musty taste destroyed, and that the cider will keep the better for it. It must, in that case, be put in as soon as the fumigation is finished. The best shaped vessels for keeping cider, are those in which the cask or vessel is wider at top than at bottom.

"A question of great importance is now to be considered. Some maintain that frequent racking spoils the cider; and others assert that it can never be good without it. Some rack once and twice, and others whenever the liquor frets or ferments. We shall therefore state the various methods, and give a general opinion on the subject.

"One mode is to leave the cider in the open vats at the press some days longer than was above advised (which was two) and till it is in some degree finer; then to put it into casks, where it is to remain without any further racking. Those who defend this practice, say their cider is stronger and better for it.

"A second and more common mode is, after barrelling it and letting it stand about a fortnight, to draw it off into fresh casks. To this second racking others add a third in March. Others, especially the Devonshire people, (whose habits and usages much resemble ours,) look upon a thorough fermentation as the great secret to have their cider light, fine and free from dregs, and accordingly they do more. At first barrelling they leave a space to receive a fresh pailful from the press. This produces a new fermentation, and is often kept up by fresh cider for a fortnight. A month after this they rack their cider into new casks, and in two months more they rack it again, and if it still frets, they often repeat it a third and fourth time.

"Such are the various practices in England, and the authors of this dictionary on the whole advise to the racking of cider. Weak cider cannot bear more than one or two rackings. Strong cider will stand several, and grow mellower for them. Above all, great pains must be taken to prevent fermentation after the liquor has become fine; this can only be done by racking. Generally the cider which is longest in refining is the strongest and most lasting.

"Another more sensible writer in the same work observes, 'that the ground apples or pumice ought to remain at least twelve hours before it is pressed at all. With respect to the temperature of the air in which cider should be kept while fermenting, or to make it ferment, he remarks that farmers have no thermometers. Some more obvious rules must be applied. They should not be exposed to frost. In the beginning, however, they cannot be kept too cool, short of frost. Hence the time when fermentation will commence is uncertain. Sometimes not till after a week, or even a month, in cold weather. Agitation in a carriage will, however, speedily bring on fermentation.

"'The continuance of the vinous fermentation is as uncertain as its beginning. Liquor which has been *agitated by transportation* will pass through it perhaps *the same day.* But other liquors, less agitated, seldom go through it under two or three days, and sometimes will continue in fermentation five or six days. With regard to ascertaining the degree of fermentation which cider has undergone, whether not great enough, or exactly right, or too great, I have not been able,' says this writer, 'to collect any fixed notions on the subject. It is a subject to which most cider makers pay little or no attention. It is true, the manufacturers of sweet cider pay some attention to fermentation. Their whole art consists not in regulating, but in checking the fermentation as far as possible.

"'Fermentation operates differently on different ciders. Thus that which is made of ripe fruit throws up a gross spume or froth, like malt liquors, forming a brown crust. The riper the fruit, the more of this brown froth or scum is thrown up.

"'Having remained some days on the lees, it is drawn off into fresh casks. Some men wait, before they rack their cider, till the brown crust begins to crack. Others prefer to rack before the fermentation is entirely over. The makers of perry rack it off when it has done hissing. The manufacturers of sweet liquors will not permit them even to hiss. They keep up the process of racking, which certainly checks the fermentation.

"'The fresh casks into which cider has been racked, are never quite filled. This is general practice. They are left short about a pailful, so that you can just touch the liquor with the end of your finger.

"'The number of rackings depends on the state of the liquor. If the fresh fermentation, which mostly commences after the racking, be violent, it is understood generally that the liquor should be racked again. Hence, in the practice of some men it is racked five or six times.

"'On the other hand, if the fermentation is moderate, it is commonly suffered to remain after the first racking. In the common practice of farmers, (English farmers,) it is racked but once. (In our practice, speaking of farmers generally, it is not racked at all, but suffered to remain in its first lees.) Those who prepare cider for sale, always think it prudent to repeat the rackings till the liquor is quiet. If this cannot be readily brought about, they have recourse to stumming. Stumming is burning matches covered with sulphur within the cask. The match is let down into the cask lighted, and the cask is thus filled with the fumes of sulphur. The cask is suffered to remain three hours, before the liquor is put into it. *Ninety-nine* casks in a *hundred* in the country, (Great Britain,) go through this process.

"'But there are some persons who prefer fermenting their cider in open vats or tubs. Some do it in deep tubs, but the most approved mode is in shallow vats, five feet in diameter, and not more than two deep, each containing about eight barrels. In these the liquor remains till it has done rising; when it is racked off without skimming, (being drawn off from the bottom.) In this case, it seldom is racked a second time.

"'There are three species of fermentation.

"'The vinous, which gives the liquor the body and qualities of wine.

"'The acetous, which produces vinegar.

"'The putrid, which utterly destroys its use.

("'The cider in our country rarely stops at the first stage. It is nine times in ten advanced far to the vinegar state.) The juices of fruits, with moderate heat and fermentation, will readily pass into the vinous state. They will, if left open and not attended to, soon after pass into the acetous or acid state; and if neglected, the putrid state will ensue.

"'The object then is, to bring on the vinous state, and to preserve the liquor in that condition.

"'The first effect of vinous fermentation is to increase the strength of the liquor, furnishing it with an intoxicating quality, which it did not before possess, and changing its medical properties. Another effect is, to lessen or destroy the sweetness of the liquor; some prefer rough, and some sweet liquors.

"'To produce rough liquors, choose austere and sour fruits. To produce sweet ones, choose sweet and luscious fruits, and check the fermentation by racking. The effect of racking is, to prevent the progress of fermentation. Filtering a liquor, drop by drop, is found to destroy fermentation.

"'Much is added by this author, on the subject of amending cider which is bad or weak, but as this more properly belongs to the retailer of cider than to the farmer, we shall at present omit it.' (Marshall's Rural Economy abridged.)

"Such are the general practices prevalent in the cider counties of Great Britain. The effect, every man who has been in that country knows, is the production of a much finer, more vinous and fine flavoured liquor than we usually have, not better than we can, and than many persons do produce. That this practice, to us apparently elaborate and expensive, is adopted in other countries, where the farmer has less inducement from prices than in Great Britain or America, will appear from the following extracts from the 'Abbe Rosier's complete course of agriculture in France.'

"'Every one has his own mode of making cider,' says this author, 'and every one boasts of it as the best. But they are all reduced to the following conditions: that is, they all agree in these opinions:

"'1. To grind the apples most thoroughly.

"'2. To leave the pumice at least six hours before it is pressed, in order to colour the juice.

"(3. Is a description of their mode of making the cheese, which is the same nearly with that of New England and Great Britain.)

"'4. The barrels, *nearly full*, are placed in a situation where the fermentation will be moderate, (that is, in a cool place.) The barrels should be filled from time to time as the froth is thrown out. But when the fermentation is done, you must bung up the barrels, and if they are to be moved, *they must be racked off into other casks*, in order that the lees may not mix with the other cider.

"'But,' says this same French author, 'if you have any vats near the press, into which you can pour the liquor, vats which will contain from twelve to twenty barrels, you will place all the cider in them. It remains in these open vats three or four days without fermenting, after which it ferments strongly. All the lees mount, as they do in wine, to the top; and when they have all ascended, and the crust is formed, you draw off the liquor by a tap below.'

"This author then proceeds to detail a method of racking very much like that of Great Britain, of which we have given so detailed an account.

"We could fill one of our numbers with extracts from foreign writers on this subject. It should not be thought derogatory to us to borrow from them in the useful arts. They have preceded us many centuries, and it will not do to reject the lessons of experience. No people avail themselves more readily, or carry the improvements of other nations further than we do. The manufacture of cider (for it is a manufacture) it still with us in its infancy. We have not only much, but every thing to learn on the subject. I speak of the people at large: of our farming practice generally.

"Our cider is the worst article we produce. Our hay, potatoes, grain, and fruit, do not depend on ourselves. They are the gifts of God, the productions of his goodness, which we call nature. Our butter, cheese, and cider are partially the result of our own industry. The two former are often indifferent enough, yet, with some important exceptions, they are in a state of improvement. Our cider is not improving; we have of late learned to treat it better in great towns, but the farmers, whose interests we espouse, drink a miserable liquor instead of an excellent one, which they might have; they obtain a reduced price for the article, in consequence of the bad state in which it is brought to market.

"It would appear from the above extracts from the works of the most celebrated writers in the best farming countries of Europe, that more ought to be done at the press, and less at the cider cellars of the cities. We get, to be sure, a clear, but a medicated and factitous liquor, easily discernible by men acquainted with the subject. The improvement, if we have any, must originate at the cider press, and the *farmer* must reap the profit, not the *retailer*, who sells it at thirty dollars per barrel.

"The difficulty now is, that families are compelled to go through this process of racking their cider frequently, and refining it, after *all which* they are not sure of having it good, and of course prefer to pay the retailers three dollars a dozen for bottled cider.

"The price of the cider paid to the farmer will always be regulated by the risk of its being good, and the trouble required to make it so. If the farmers could reduce the liquor into a vinous state, and it is much more easily done before the agitation of a removal, before it is transported to market, they would obtain five and even ten dollars a barrel instead of three. I have no hesitation to say, that cider not only reduced to the vinous state, but refined, would more readily bring from five to ten dollars a barrel than it now does three.

"Something too must be allowed for the addition to their own comfort and enjoyment. With three days labour of one man, forty barrels of cider may be sufficiently attended to, racked one or more times, the casks rinsed, and stummed with sulphur; then the farmer would never have to resort to foreign liquor to regale his friends. A good bottle of cider is often equal to the best Champagne, the most popular wine of France.

"It may be thought that the rules above extracted are too numerous, and too complicated. We shall show that they are essentially reducible to a few, and yet they are mostly such as we are not in the practice of adopting. If this publication shall have the effect of inducing one publick spirited man in each town, to adopt all or any of these recommendations, our object will have been answered.

"The rules may be reduced to the following, the respective importance of which we shall notice as we proceed.

"First. 'Apple orchards ought to be planted with the same kinds of fruit, or with fruits which ripen as nearly together as possible.'

"This, though valuable, is not among the most important rules. It is, however, very important that there should be no early summer or autumn apples in the cider orchard.

"Two or three trees near the house for early fruit may not be amiss, but for cider they are generally lost and wasted.

"Second rule. The apples, whenever gathered, should be put for some time in piles, and before they are pressed, should be sorted, and not only the rotten ones separated, but those only ground together which are of a uniform and equal degree of ripeness. The first part of this rule is followed with us; the second is but too much neglected.

"Third rule. The pumice should be suffered to stand from six to twenty-four hours, according as you may wish to give a higher or paler colour to your cider. But in our climate, if the weather is hot, it should be turned frequently, to prevent fermentation.

"Fourth rule. The first runnings of the press should be kept separate, being a superiour quality of cider.

"This, it is believed, is seldom attended to. Barrels warranted of this sort ought to fetch, and after a short time, would fetch a greater price.

"Fifth rule. Where the farmer is rich and forehanded, it is advisable to have a vat made near the press, which will contain from eight to twenty barrels. This may be made either square or round. Into this vat the cider, as it is made, should be turned, and suffered to work off in the open air. This will save much future trouble. There should be a cock, or tap and faucet, near the bottom, to draw off the cider when the scum or crust is perfectly formed.

"But lastly. If farmers will not go to this expense, they should leave their barrels not full by a gallon or two, and as they work off, they should fill them up, and after they have done working, rack them into other casks. This should always be done before they are sent to market, or put into the place where they are to remain. Removing them before they are worked produces an agitation often fatal to the cider.

"Such is the invariable practice as to wine. There is no difference between the two liquors, except the fruit from which they are made. They undergo the same process of fermentation. Wine, if neglected as we do our cider, would be an acid and vile liquor.

"If these ideas shall contribute to give information to those who have not books at command, I shall be happy."

MEDICINAL PROPERTIES OF CIDER.

This excellent liquor contains a small proportion of spirit, but so diluted and blunted, by being combined with a large quantity of saccharine matter and water, as to be perfectly wholesome. When of a proper age and well refined, pure cider may be considered as a pleasant and salutary beverage, and calculated to obviate a putrid tendency in the humours.

Strong, astringent cider, well impregnated with fixed air in bottles, has been found of great utility in various diseases. In low fevers of the putrid kind, it is not merely a good substitute, but is equally efficacious with port, or other foreign wines.

"*Excellent brandy* is made from apples in the United States, notwithstanding what Chaptel has said on the subject. If carefully distilled from sound apples, and kept a few years in a warm situation, it is very agreeable, when diluted with water. One wineglass full, added to a half gallon bowl of punch, highly improves the flavour of that drink."

POMONA WINE.

"It is said that several of the agricultural societies have adopted regulations for the encouragement of American beverage, at their annual jubilees. *Currant wine* is to be substituted for *claret;* and the great staple of New England, *cider*, is to be substituted for *Madeira*. The following is a receipt to make it:

"Take cider, made of sound apples, sweet from the press, and leach it through a barrel filled with clean dry sand. After it has passed through, carefully drain it off into a brass or copper kettle, in which it must be boiled one hour over a slow fire, and skimmed clean. After it has been taken off and cooled, strain it through a fine cloth, and put it into a cask that is perfectly clean. Set it in a cool part of the cellar, and let it remain five or six weeks, when one quart of best French brandy, and one pound of raisins must be added to eight gallons.

" It ought to be made a year, at least, before it is used. It is needless to state that the quality of the liquor will be improved by age."

" This American process has, of late years, been imitated in the cider counties, and particularly in the west of England, where several hundred hogsheads of cider wine are annually prepared; and being supposed to contain no particles of copper, from the vessels in which it is boiled, the country people consider it as perfectly wholesome, and accordingly drink it without apprehension. In order to ascertain the truth, various experiments were instituted by the late Dr. Fothergill; from the result of which he proved that cider wine does contain a minute portion of copper, which, though not very considerable, is sufficient to caution the publick against a liquor that comes in so very questionable a shape. Independently, however, of the danger arising from any metallick impregnation, we doubt whether the process of preparing boiled wines be useful, or reconcileable to economy. The evaporation of the apple juice by long boiling, not only occasions an unnecessary consumption of fuel, but also volatilizes the most essential particles, without which the liquor cannot undergo a complete fermentation, so that there can be no perfect wine. Hence this liquor is, like all other boiled wines, crude, heavy and flat; it generally causes indigestion, flatulency and diarrhœa. Those amateurs, however, who are determined to prepare it, ought at least to banish all brass and copper vessels from this as well as from every other culinary process." (Mease.)

The most valuable liquor to be obtained from apples, unquestionably, is the cider wine made according to the following process.

APPROVED METHOD OF MAKING WINE FROM CIDER.

To one barrel of cider, when just from the press, add half a pound of sugar to each gallon, and two gallons of brandy, West India spirit, or cider brandy. The cask must be lightly stopped, and filled up every day, while fermenting, for four or five days, and then stopped tight and put into a cool cellar. In three or four months rack it off, and add two gallons more of brandy to each barrel. Take one quarter of a pound of burnt alum, six whites of eggs, and one pint of clean sand, mixed together, and put them into the barrel when racked, to clarify. When racking, the liquor must be kept from foaming, by letting it run down on a thin board; and when the cask is about half full, while racking, a match of sulphur must be burned in it, and then the cask stopped close and shook, so that the smoke may incorporate with the liquor. In one year this will be equal to sherry wine, and in two, equal to the best Madeira. Having made one cask of this kind a few years since, it so far exceeded my expectations, that I can with confidence and pleasure recommend it to general notice, as a liquor possessing the qualities of a sprightly, cordial wine, the cheap produce of our own farms, and free from any deleterious metallick impregnation.

OF PEARS.

It is no longer questionable that the pear tree is well adapted to the climate and soil of New England. Although much neglected by our farmers generally, numerous varieties are cultivated in different parts of Massachusetts, in great perfection. All the varieties of the pear are hardy and long-lived, and will flourish in a clay or loamy soil, but wet situations are unfavourable. Most of the directions already detailed, relative to the cultivation of the apple tree, may be applied to that of the pear tree. The production of particular varieties from the seed is equally capricious, and the annihilation of certain kinds from long duration, is supposed to be no less remarkable than in the apple. The propagation of particular species is effected by grafting or budding, and by this method any desired variety may be obtained and perpetuated. Considerable attention is necessary in the choice of stocks for grafting. Suckers from other trees should never be employed, as they will have a constant tendency to generate suckers, to the injury of the tree. It should be observed, to graft or bud summer pears only upon summer pear stocks; autumn pears upon stocks of the same kind; but never graft a winter pear upon a summer pear stock, for the sap of the summer pear will decline or diminish, before the winter fruit has sufficient time to mature and ripen. Every planter should keep a nursery of free stocks, by planting the seeds of the different varieties, and these should be taken from fair and choice fruit, and in their ripe state. The season for grafting or budding, and the manner of performing the operation, are the same as already described for the apple. The pear tree will succeed very well, when grafted on a quince; in which case, it is preferable to graft under ground in the root, as the tree will be more strong and vigorous; whereas, if grafted above the surface, the produce will be a dwarf tree. In transplanting pear trees, we are advised, when the soil is dry and sandy, to perform the business in autumn, and they will gain root fibres enough to support them, before winter, and will shoot in the spring better than those which are planted in April. But in moist places, it is best to dig the holes in autumn, and plant in April, as the cold of winter might greatly injure them. The soil for pear trees ought to be two or three feet deep, and they should be planted shallow, that the roots may spread near the surface, and enjoy the benefit of the sun and air; and by some it is accounted useful to expose the same side to the sun as when in the nursery. Pear trees require but little pruning, comparatively with the apple, and if carried to excess, it proves very injurious. All dead branches, however, and even thrifty ones, which interfere and chafe each other, and every sucker proceeding from the trunk or roots, should be carefully removed. Every large wound should be covered with the composition or cement, as a security against the effects of the sun and weather. If affected with diseases, or infested with insects, the appropriate remedies, recommended for apple trees, must be applied. In the Agricultural Repository, vol. iv. is a communication from Mr. Hammon, of Talbot county, Maryland, to the following purport. "Pear trees, and other fruit trees, are frequently affected, and sometimes suddenly decay, without discovering the causes of their decline. A gentleman of this neighbourhood, some years ago, observing the situation of his trees, and having unsuccessfully used many applications, at length directed their trunks or bodies to be washed with *soft soap;* and it is not easy to imagine the early change which appeared in the bark and foliage: the bark became smooth and glossy, and seemed sound and beautiful; and he thought the tree was greatly improved in every respect. I have tried the same experiment, and with equal advantage to apple trees; and am persuaded they have been greatly benefited by this process. It is used in the spring, and may be repeated in the following years, as frequently as the trees appear to require it. Mr. Peters declares, that he used *soap suds* without beneficial effects; but it is probable that the *soft soap* in substance is more powerful, and that having more strength and virtue than the suds, as commonly made, it may more effectually destroy the worms, bugs, and other insects, which so materially injure the trees; and it is believed to be in consequence of their destruction, that the bark and branches are enabled to derive so much improvement from the application of this substance."

Mr. Forsyth's treatise contains his method of managing diseased pear trees, and such as were unfruitful from decay, and has clearly demonstrated, that the quantity of fruit was thereby remarkably increased, and the quality greatly improved. When old trees are affected with canker, or otherwise diseased, by which they are rendered unproductive, his practice is, to head them down in May or June, as near as possible to where they were engrafted. By this method the young shoots soon sprout forth, and grow so rapidly, that in two or three years they bear fruit most abundantly. Mr. F. illustrates his practical principles by two or three striking examples, and by plates representing the trees and fruit. One of the first four which he headed down, was a Saint Germain, which produced nineteen fine, large, well-flavoured pears the next year, and in the third, bore more fruit than it did in its former state, when it was four times the size. Another bore four hundred pears the second year; and he finally found, that the trees headed down bore upwards of five times the quantity of fruit that the others did; and it keeps increasing, in proportion to the progress of the trees. "On the 20th of June," says Mr. F., "I headed several standards that were almost destroyed by the canker; some of them were so loaded with fruit the following year, that I was obliged to prop the branches, to prevent their being broken down by the weight of it. In the fourth year afterwards, one of them bore two thousand eight hundred and forty pears, while another tree, not headed down, growing by its side, being twenty years old, bore five hundred pears, which was a good crop for its size: so that there were on the old tree, which had been headed down not quite four years, two thousand three hundred and forty more than on the tree of twenty years growth."

The following is Mr. Forsyth's method of training the trees, that are cut near the place where they were grafted. Every year, in the month of March, (April or May for our climate,) he shortens the leading shoot to a foot or eighteen inches, according to its strength. This shoot will, if the tree be strong, grow from five to seven feet long in one season; and, if left to nature, would run up without throwing out side shoots. The reason for thus shortening the leading shoot is, to make it throw out side shoots; and if it be done close to a bud, it will frequently cover the cut in one season. When the shoots are very strong, he cuts the leading shoot twice in one season: by this method he gets two sets of side shoots in one year, which enables him the sooner to fill the tree. The first cutting is performed any time during the spring, and the second about the middle of June. When you prune the trees, and cut the fore-right shoots in April, always cut close to an eye or bud, observing where you see the greatest number of leaves at the lower bud, and cut at them; for, at the foot-stalk of every one of these, will be produced a flower bud. You will have in some sorts, of pears, in a favourable season, from five to nine pears in a cluster. This cutting should not be later than April, on account of the leading shoot beginning to grow; the next topping, when the leading shoot grows quick enough to admit of it, should be about the latter end of June; and the length of the shoots should be according to their strength, having from three eyes or buds to six on a side. Mr. Forsyth has been successful in renovating old trees when in such an advanced state of decay, that very little, except the bark, remained. He always applies the composition to the wounds, and when, on examination, the root is found to be decayed and rotten, he cuts away all the dead part, to the sound wood, and covers the wound. If the above directions be followed, he says, you will get more pears in three or four years, than you can in twenty-five years by planting young trees, and pruning and managing them in the common way. If it be desired to change the kind of fruit, it will be easy to graft or bud upon the young shoots.

The method recommended by Mr. Knight for reclaiming old unproductive pear trees is, to cut away all the central branches, retaining those only that are nearly horizontal, and all the spurs of these must be taken off closely with the saw and chisel. Into the extremities of the branches thus retained grafts are to be inserted at proper distances, so as to form a new crown. It was on an old Saint Germain pear tree, that had been trained to the wall in a fan form, that he adopted this mode. As soon in the succeeding summer, as the young shoots had attained sufficient length, they were trained *almost perpendicularly downwards between the larger branches and the wall*, to which they were nailed. In the second year, and subsequently, the tree yielded abundant crops, the fruit being equally dispersed over every part. Grafts of no fewer than eight different kinds of pears had been inserted, and all afforded fruit, and nearly in equal plenty. The same mode is applicable to common standard trees. By this mode, Mr. K. remarks, the bearing branches, being small and short, may be changed every three or four years, till the tree be a century old, without the loss of a single crop, and the central part, which is almost necessarily unproductive in the fan mode of training, and is apt to become so in the horizontal, is rendered in this way the most fruitful. Where it is not desired to change the kind of fruit, nothing more of course is necessary than to take off entirely the spurs and supernumerary large branches, leaving all blossom buds which occur, near the extremities of the remaining branches.

A pear tree brought from Holland, and planted in the year 1647, is now in full bloom, standing in the third avenue at the intersection of Thirteenth street, (New York.) This is probably the oldest fruit tree in America. About seventy years ago the branches of the tree decayed and fell off; and at that time it was supposed the tree was dying; but, without any artificial means resorted to, new shoots germinated and gradually supplied the roots of their predecessors. The tree now is in full health and vigour, and appears to be not more than thirty years old; the fruit ripens the latter part of August, has a rich succulent flavour, and has been known by the name of the spice pear. (New York Evening Post, May 4, 1820.)

From the pear is prepared a pleasant liquor, known under the name of perry, which is made in the same manner as cider from apples. In England, particular kinds of pears are cultivated for this purpose, and the liquor is held in high estimation.

The subjoined list contains a selection, from various sources, of such as are much esteemed as table-fruit, or will meet a ready sale at market.

1. *Brockholst bergamot.*—A delicious pear, ripe early in October.

2. *Brown beurre*—Is a large and long fruit, of brownish red colour next the sun, melting, and full of sharp rich juice, slightly perfumed. Indeed, it is one of the best autumn pears we have. Ripens in October.

3. *Catharine pear.*—Of this there are several varieties, the earliest of which ripens in July, and another kind in August. They are considered well deserving of cultivation, as an excellent summer fruit for the dessert and for baking. The tree grows large, and is very fruitful.

4. *Chaumontelle*, or *winter beurre.*—"It is a large, rich flavoured, melting pear; the skin a little rough; often of a pale green colour, but becoming purplish next the sun, sometimes with a good deal of red. The fruit is left on the tree till the close approach of winter. It is fit for eating in the end of November, and continues till January."

5. *Colmart*, or *manna pear*—"Is large and excellent; the flesh very tender and melting, and the juice greatly sugared. Both in shape and quality, it considerably resembles the autumn, or English bergamot. It keeps through the winter, till the end of February."

6. *Crassane*, or *bergamot crassane*—Is a pear of a large size and round shape, with a long stalk: the skin is roughish; of a greenish yellow, when ripe, with a russety coating: the flesh is very tender and melting, and full of a rich sugary juice. It is fit for use from the middle to the end of November, and is one of the very best pears of the season.

7. *Easter bergamot*, or "*winter bergamot*—Is a large roundish fruit, of a grayish green colour, with a little red: the flesh between breaking and melt-

ing. The fruit is fit for the table in February, and keeps till April."

8. *Garden pear.*—This ripens in November. It is large and rather long; the skin yellow, and the flesh yellow, rich, and juicy. It is cultivated in Massachusetts, and is highly esteemed.

9. *German muscadel pear*, or *muscat allemand.*—" A noble, large, pyramidal fruit, with a small blossom on a shallow excavation, and rather a long stalk. When ripening on the floor, it acquires a red and yellow tint. Its flesh is melting and delicate, full of a spicy, delicious juice, similar to that of muscadel grapes. Eatable from March till May. The tree forms a fine crown, and is exceedingly productive."

10. *Green summer sugar pear*, or *sucre vert*—Has a very smooth green skin; flesh melting, and the juice sugary, with an agreeable flavour: the tree is a free bearer. Its period of ripening is in August, and it can be preserved only a few weeks. The tree bears fruit every year, and its blossoms resist the most unfavourable weather.

11. *Grey butter pear*— } Are well known to
12. *White butter pear*— } amateurs, and deserve to stand in every orchard, being excellent autumnal fruits. The white butter pear is also very excellent for culinary purposes, even before it attains to maturity by lying on the floor. In a good soil, it often forms a very large tree; but the gray butter pear is of a lower growth, though with more expanded branches.

13. *Jargonelle.*—This is a well-known, fine summer pear, ripening in August. The flesh is breaking, sweet, and has a slightly musky flavour. It is best when picked before fully ripe, and matured in the house. The tree is a general bearer.

14. *Little muscat*—Is of a longish shape, of a yellow colour, except next the sun, where it is red. Ripe in August.

15. *Mons Jean*—Is a valuable pear. It is ripe about the first of November, and will last till the middle of December.

16. *Orange pear.*—This has been long cultivated in Massachusetts, and is still a favourite fruit among those who are unacquainted with the superiour kinds more recently introduced. The fruit is roundish; the skin of a greenish colour, becoming yellow when ripe; the flesh is melting, and the juice sugary; the flavour pleasantly perfumed. It ripens in August, and, like all summer pears, is of short duration.

17. *Pound pear*—"Is an extraordinary large, thick, oblong fruit, of a greenish gray colour: it is often reared in the vicinity of buildings, to shelter its ponderous fruit from boisterous winds, before it has attained to maturity. Though its pulp be somewhat tough, it is a very useful pear in domestick economy, especially for drying. The tree rises to a considerable height, and spreads its branches; is very productive, and its blossoms are not liable to be injured in the spring." The fruit should be suffered to remain on the tree till frost, and then preserved in the common manner, for baking and other culinary uses. There is a variety generally called the small pound pear, which acquires only half the size of the former, but possesses all its valuable properties.

18. *Non-pareil bergamot*—"Is a considerably large pear, with a green peel, containing a mellow pulp of an incomparable aromatick taste. It becomes eatable in October and November. The tree is one of the largest among the bergamots."

19. *Prince's pear*—"Is a small roundish fruit, of a yellow colour, but red next the sun: flesh intermediate between breaking and melting; juice high flavoured. The tree is generally a great bearer, and the fruit will keep for a fortnight."

20. *Radish pear.*—"A very superiour summer fruit, the juice of which is so rich, refreshing and agreeably acidulated, that it excels in its kind the gray butter pear. But as it easily becomes mealy, though of a muscadel flavour, when left to ripen on the tree, it ought to be removed, and deposited on the floor. The tree is remarkably fertile, and produces fruit in seasons when almost every other pear kind has failed; hence it deserves to be reared, even in climates and situations not very favourable to orchards; as it is of vigorous growth, and attains to tolerable size."

21. *Rousseline.*—"Is of a deep red colour, with spots of gray; the flesh is very tender and delicate, and the juice very sweet, with an agreeable perfume. It ripens about the latter end of October, but will not keep."

22. *Sarasin.*—A valuable winter pear, "which ought to decorate every orchard, as it may be preserved a whole year. In shape and size it resembles the *brown Louise,* but generally becomes much larger. Its red colour rises on the south side: when it turns yellow in July, acquires a buttery consistence, and is then eatable. This likewise affords an excellent fruit for boiling, drying, and other domestick uses. The tree is tall and vigorous."

23. *Seckle pear.*—In a letter from professor Hosack, of New York, dated October, 1818, to the London Horticultural Society, and published in their work, we are favoured with the following account of this most estimable fruit:

"The Seckle pear is so named from Mr. Seckle, of Philadelphia, who has the credit of having first cultivated it in the vicinity of that city. It is generally considered to be a native fruit of this country, accidentally produced from seed sown by Mr. Seckle, and the original tree is said to be still standing on the estate of that gentleman. An account, however, essentially different from this, has been lately communicated to me by my friend judge Wallace, of Burlington, to whom I recently paid a visit. He stated to me, on the authority of a correspondent in Philadelphia, that the pear was grown in that neighbourhood, sixty years ago, by a person named Jacob Weiss, who obtained the tree, with many others, at a settlement of Swedes, which was early established near Philadelphia, where Mr. Weiss had built a house. The judge suggested the probability of Mr. Weiss and the father or grandfather of Mr. Seckle having been intimate, as both families were German, and of that rank in society, which might be likely to lead to such an acquaintance. The conjecture therefore, is, that under such circumstances, Mr. Seckle's family obtained grafts from Mr. Weiss's tree.

"Mr. Coxe, in his view of the cultivation of fruit trees in America, an interesting volume, which I have forwarded to the society, after assigning the same origin as I have stated in the beginning of this letter, describes the fruit thus: 'The form and appearance vary with aspect, age and cultivation: the size generally is small; the form regular, round at the blossom end, diminishing with a gentle oval towards the stem, which is rather short and thick: the skin is sometimes yellow, with a bright red cheek, and smooth; at other times, a perfect russet, without any blush: the flesh is melting, spicy, and most exquisitely and delicately flavoured. The time of ripening is from the end of August to the middle of October. The tree is singularly vigorous and beautiful, of great regularity of growth and richness of foliage, very hardy, possessing all the characteristicks of a new variety. Neither Rosier or De La Quintinge among the French, nor Miller or Forsyth among the English writers, describe such a pear as the Seckle; nor have I found one among the intelligent French gentlemen in our country, who has any knowledge of it in his own.'

"I may add to the above, that the fruit is admitted by all to be one of the most exquisitely and highly flavoured we possess. Its flavour is very peculiar, having a factitious aromatick perfume, rather than the natural odour or taste of fruits. The late general Moreau informed me that he had never tasted this fruit in France, the country in which, of all others, the finest pears are cultivated."

24. *Skinless pear*, or *early ruselet.*—This is a long shaped, reddish coloured fruit, with a very thin skin; the flesh melting, and full of a rich sugary juice. It ripens in August.

25. *Squash pear.*—This pear is cultivated in Massachusetts, and Mr. Coxe thus describes it. The fruit of highest estimation for perry in England; it is an early pear, remarkable for the tenderness of its flesh; if it drops ripe from the tree, it bursts from the fall; whence probably its name. The liquor made from it is pale, sweet, remarkably clear, and of strong body; it bears a price fourfold of other perry.

26. *Saint Germain*—Is a large, long pear, of a yellowish colour when ripe; flesh melting, and very full of juice, with considerable flavour. If the tree be planted on a dry soil, in a warm situation, and trained against a wall, it bears pretty freely. There are two varieties, a spurious and the true; and it is believed, the former is by much the more generally disseminated. The true is of French origin, and often is very large, of a pyramidal form, having a thick and dotted green skin, but which, while ripening on the floor, becomes yellow. The spurious fruit ripens in December, remaining green when ripe, and generally decays by the end of January: unless the soil and season be favourable, it is insipid and watery; it is shorter, and its form is subject to more variations than that of the true variety. The true St. Germain keeps in perfection till the

end of March, and for sweetness and flavour, ranks among the very best of the winter pears. Mr. Coxe complains that this tree, in our climate, is very subject to the fire blight, so destructive of the finest and most delicate pears in this country; and observes that it would be highly useful to the cultivators of fruit could the cause or cure of this evil be discovered.

26. *Saint Michael's*, or *yellow butter pear.*—The same as the *Doyenne*, or *Dean pear.* For the richness of its flesh, and excellence of flavour, it is said to be inferiour to none except the *Seckle*; and few pears are more admired and extensively cultivated in the United States. The fruit is large, round, inclining to oblong in shape, fair and handsome; its skin glossy and smooth, resembling unpolished gold; occasionally streaked and marked with bright yellow spots. It displays either a blush or bright russet on the south side. The flesh of this luscious fruit is white, and the juice so remarkably cold that it sometimes offends a weak stomach, and occasions eructations. It should be gathered before it is quite ripe, and matured in the house, in order to have it in true perfection; and it may be in use from the beginning of September to the first part of November. The tree does not grow to a large size, but is an early and never failing bearer.

27. *Summer good Christian*—Is a large, oblong fruit, with a smooth and thin skin, of a whitish green colour, but red next the sun; full of juice, and of a rich perfumed flavour. It ripens in August. The tree is large, and generally fruitful.

28. *Virgouleuse.*—"A delicious pear, of a pyramidal form, with a deep bloom, and short fleshy stalk. Its peel is whitish green, and, if ripening on a floor, (from December to March,) generally acquires a fine yellow tint: its pulp melts in the

mouth, yielding a copious aromatick juice. The tree grows to a moderate height."

29. *Winter baking pear.*—This fruit abounds in Massachusetts, and is much valued as a baking pear. It is not eatable in a raw state, not being juicy or well flavoured. It keeps well through the winter, and the flesh, on being baked, turns to a fine red colour. The tree is not large, but seldom fails of affording an annual crop of fruit.

30. *Winter good Christian.*—The fruit is very large; the flesh is tender and breaking, and is very full of a rich sugared juice. The fruit is in eating from March to June.

31. *Winter thorn.*—(Epine d'hiver)—" In size and shape is similar to many kinds of egg-pears. Its peel is at first whitish gray, and turns yellow when ripening on the floor. The pulp is mellow, sweet, and of a delicious aromatick taste. This pear is fit to be eaten in November, and remains sound till the end of January. The tree vegetates with great luxuriance."

QUINCE TREE.

The quince may be propagated by layers, or young sprouts, which must be covered in the earth, or by cuttings taken from the tree in April, and set into the ground at proper distances, where they will take root the first season, and they may be transplanted at pleasure to the place of their ultimate destination. This tree may also be propagated by budding or grafting; and, according to Mr. Forsyth, trees thus obtained will bear sooner and be more fruitful than those reared by any other method. Quince trees flourish best, and are more productive in a moist soil, though the fruit from those set in dry situations, is said to possess a finer flavour. The quince tree requires but very little pruning; the most important part of their management consists in clearing their stems from suckers, and in cutting off such branches as interfere with each other. All luxuriant shoots that strike up from the middle of the tree, must be lopped off, to prevent the head from being too much crowded with wood, which might impede the growth of the fruit. If the tree becomes diseased or rotten, the dead parts should be cut away, and the composition applied, as in apple trees. We are advised to plant quince trees at a good distance from apple and pear trees, lest the farina become mixed, and the fruits degenerate. The quince tree is liable to the attack of the worm *borer*, the same as the apple and peach tree; and the same remedies are to be recommended.

OF PEACHES.

The soil and climate of our southern and middle states are considered as peculiarly congenial to the growth of the peach tree, and, accordingly, it has long been more generally and extensively cultivated there than in any other section of the union. It is reared on every plantation, and not unfrequently peach orchards, covering many acres, and consisting of several thousand trees, are presented to the view of the traveller. It is, however, more for the purpose of distillery than the luxury of the table, that this species of fruit receives so much attention from our southern brethren; an excellent and highly-flavoured brandy being obtained from it by distillation. It is exceedingly to be regretted, that the peach tree of late years has become liable to premature decay, and the period of its duration is greatly diminished, insomuch, that its continuance in a healthy bearing state seldom exceeds three or four years. This misfortune is increased by the circumstance, that a peach orchard cannot be reared a second time on the same spot, unless the soil be renovated by several years intermediate culture of other crops. The soil best adapted to the peach tree is a mellow, sandy loam. Situations naturally wet, or inclining to clay, are unfavourable. Water should never be suffered to stand round the roots of tender trees, especially in strong land, as it is apt to produce the mildew, and destroy them.

In England, peach trees are planted against a wall, to which their branches are trained, and nailed either in the fan form, or nearly horizontally, and being the subjects of particular care and culture, it is not uncommon for peach trees to continue to produce annual crops during forty years.

The propagation of peach trees is accomplished either by planting the stones or kernels, or by budding on proper stocks. By the first method there is constantly a great tendency to deviate from the nature of the variety from which the seed was taken, and the variety may be almost indefinitely increased. In Maryland and Virginia, this last mode is adopted without budding, by which numerous varieties are obtained, and among them are found some of superiour quality. It, indeed, on some occasions happens, that the same fruit is produced with that of the seed planted. The stones are planted in beds or drills, in October or November, or they may be preserved in sand, and planted in March: in this case the stones must be broken open without injuring the kernel, which is the part to be planted. In one year the seedlings may be transplanted in rows into the nursery, which may be done either in autumn or spring. It is to be recollected, that neither the stones nor seedling trees should be planted on ground lately occupied by peach trees, unless the whole of the old roots be removed, and fresh mould be put in to supply the place of the old. But the most certain method of preserving a particular variety is by budding; peach trees thus obtained, always afford fruit in size, colour, and taste, exactly similar to that of the tree from which the bud was taken, and come sooner into a bearing state. Stocks, on which peaches may be budded, besides those of their own kind, are the almond, the apricot, and the plum. The proper season for budding, is the month of August, and the operation is to be performed in the manner directed for apples and pears. In two or three years after budding, they bear fruit. In taking up the young trees, care must be taken to preserve the roots as much as possible. Such parts as are bruised should be removed, and the small roots may be a little shortened. It is important that the trees be equally filled with side shoots from top to bottom; for when suffered to run up in single branches, the trees in general are so weak and spongy, that they are unable to bear good fruit. Accordingly, when the seedlings are about one year old, Mr. Forsyth recommends to head them down to five or six buds, or otherwise to cut off the extremities of the leading shoots, which will make them send out side shoots, and form a handsome, fruitful tree. None of the shoots should be suffered to grow too long during the first and second years, which is easily prevented by pinching off the tops of them with the fingers during the month of June. When peach trees come into a bearing state, they produce two sorts of buds: where three stand close together, the two on each side are called flower or blossom buds, and the central one is called a wood bud. The former rise immediately from the eyes of the shoots, and are round, short, and prominent, while the wood, or shoot buds are oblong, narrow, and flattish. Sometimes whole trees, or a large proportion of the branches, produce nothing but single flower buds, and in pruning, if a shoot be cut off at a single flower bud, the remains of it, as far down as the next wood bud, it is said, will surely die; it must, therefore, be observed, as a rule, to cut just above the cluster of three buds, and the wood bud will shoot forth and become the leader, and be prepared to produce fruit the next year.

It is the practice of Mr. Forsyth, when old peach trees run up too high and thin, to cut them down as far back as he can find any shoots or buds, always leaving some young shoots or buds, otherwise there will be great risk of killing the tree. If there are a few young shoots, the top may with safety be cut off just above them, as they will lead the sap up, and produce strong branches, which should be topped, the same as a young tree. The operation should be performed in the month of May, and the young shoots will bear fruit the next season. The composition must be applied to the wounds, where the old branches are amputated, and the canker should be carefully cut out, and any part where the gum is seen to ooze, or the new wood will be affected as it begins to grow. When young trees are overloaded with fruit, it is absolutely necessary to thin them out while small, according to the strength of the tree.

"The premature decay of peach trees has been ascribed to various causes; by some, to the degeneracy of the soil, and neglecting to mature them regularly; by others, to the supposed alteration of the climate, the changes from heat to cold being more sudden and violent now than formerly, when the country was more in forest. But the true causes, as detailed by Dr. Mease, (Dom. Ency.) seem to be the following."

“Peach trees are liable to three casualties:

“1. The fly, that deposits eggs near the root, and there forms a worm.

“2. The bursting of the bark by severe frosts in wet winters.

“3. The splitting off the limbs at the fork of the tree.

“The fly, which is blue, (but not a wasp,) begins its attack about the middle of July, and continues its depredations until the middle of September. It wounds the tender part of the bark, and *generally* at the surface of the ground, there depositing its eggs, which hatch into worms, that prey upon the mucilage and tender part of the bark, until the communication between the root and the branches is cut off, causing the death of the tree. To guard against this, raise a little hillock in the month of June, round the tree, about a foot high, so as completely to cover that part of the bark kept moist and tender at the surface of the ground. This hillock will not stand so long at one height, as to tender the bark above, as the rain will gradually wash it down level with the surface, and must be raised again every summer.”

“To take out the worm, the roots must be uncovered, and the spot looked for where the gum oozes out, following the cavity round with the point of a knife, until you come to the solid wood, and lay the whole open: the worm will be found with a white body and black head; which must be destroyed, and the holes carefully filled up with cow-manure, rendered adhesive by sand or lime core and ashes, as directed by Forsyth.

“Soap suds, heated after a family wash, and poured on the roots of trees, about the middle of August, have been used with success in destroying the eggs, or the young worm.

“According to Mr. John Ellis, of New Jersey, the injury arising from the worm may be prevented in the following way:

"In the spring, when the blossoms are out, clear away the dirt so as to expose the root of the tree, to the depth of three inches; surround the tree with straw about three feet long, applied lengthwise, so that it may have a covering, one inch thick, which extends to the bottom of the hole, the butt ends of the straw resting upon the ground at the bottom;—bind this straw round the tree with three bands, one near the top, one at the middle, and the third at the surface of the earth; then fill up the hole at the root with earth, and press it closely round the straw. When the white frosts appear, the straw should be removed, and the tree remain uncovered till the blossoms put out in the spring.

"By this process, the fly is prevented from depositing its egg within three feet of the root, and although it may place the egg above that distance, the worm travels so slow that it cannot reach the ground before frost, and therefore it is killed before it is able to injure the tree.

"The truth of the principle is proved by the following fact. I practised this method with a large number of peach trees, and they flourished remarkably well, without any appearance of injury from the worm, for several years, when I was induced to discontinue the straw with about twenty of them. *All those which are without the straw have declined, while the others, which have had the straw, continue as vigorous as ever.*" Thus far Mr. E.

"To guard against frost, plant the trees where the water will run off, and procure the sweetest and richest fruit, as the inferiour qualities are more injured by cold.

"The splitting of the tree at the forks is guarded against by preserving as many upright branches as can be spared, by breaking off, in bearing years, more than half the quantity of fruit while small, and by pruning almost the whole of every branch beyond where the fruit is set, leaving only a few buds on each, of the succeeding year's fruit. The size of the fruit is by these means rendered larger, more beautiful, and of a higher flavour, and the growth of the tree is rendered more vigorous."

"Mr. Thomas Coulter, of Bedford county, Pennsylvania, gives the following directions for cultivating peach trees, which he has successfully pursued in Pennsylvania and Delaware, for forty-five years. See Trans. Amer. Phil. Soc. vol. v.

"The principal causes of peach trees dying while young, are the planting, transplanting, and pruning the *same stock;* which causes the stock to be open and tender, and the bark of the tree very rough: this roughness of the bark gives opportunities to insects to lodge and breed in it; and birds search after these insects, for their support, and with their sharp bills, wound the stock in many places; from which wound the sap of the tree is drawn out, which congeals, and never fails to kill, or to render the tree useless, in a few years. To prevent which, transplant your peach trees, as young as possible, where you mean them to stand; if in the kernel, so much the better; because in that case there will be no check of growth, which always injures peach trees. Plant peach trees sixteen feet apart, both ways, except you would wish to take your wagon through the orchard to carry the peaches away; in that case, give twenty-four feet distance to every fifth row, one way, after transplanting. You may plough and harrow amongst your peaches for two years, paying no regard to wounding or tearing them, so that you do not take them up by the roots. In the month of March, or April, in the third year after transplanting, *cut them all off by the ground;* plough and harrow amongst them as before, taking special care not to wound or tear them in the smallest degree, letting all the sprouts or scions grow, that will grow; cut none away, supposing six or more should come up from the old stump; the young scions will grow up to bearing trees on account of the roots being strong. Let no kind of beasts into peach orchards, *hogs excepted*, for fear of wounding the trees; as the least wound will greatly injure the tree, by draining away that substance which is the life thereof; although the tree may live many years, the produce is not so great, neither is the fruit so good. After the old stock is cut away, the third year after transplanting, the sprouts or scions will grow up all round the old stump, from four to six in number: no more will come to maturity than the old stump can support and nourish; the remainder will die before ever they bear fruit. These may be cut away, taking care not to wound any part of any stock, or the bark. The sprouts growing all round the old stump, when loaded with fruit, will bend, and rest on the ground in every direction, without injuring any of them, for many years, all of them being rooted in the ground as though they had been planted. The stocks will remain tough, and the bark smooth, for twenty years and upwards; if any of the sprouts or trees from the old stump should happen to split off or die, cut them away; they will be supplied from the ground by young trees, so that you will have trees from the same stump for one hundred years, as I believe. I now have trees thirty-six, twenty, ten, five, and down to one year old, all from the same stump. The young trees coming up, after any of the old trees split off or die, and are cut away, will bear fruit the second year; but this fruit will not ripen so easily as the fruit on the old trees from the same stem. Three years after the trees are cut off by the ground, they will be sufficiently large and bushy to shade the ground, so as to prevent grass of any kind from matting or binding the surface, so as to injure the trees; therefore, ploughing is useless, as well as injurious; useless, because nothing can be raised in the orchard, by reason the trees will shade all the ground, or nearly so; injurious, because either the roots, stock, or branches will be wounded: neither is it necessary ever to manure peach trees, as manured trees will always produce less and worse fruit than trees that are not manured; although by manuring your peach trees, they will grow larger, and look greener and thicker in the boughs, and cause a thicker shade, yet on them will grow very little fruit, and that little will be of a very bad kind—generally looking as green as the leaves, even when ripe, and later than those that have never been manured.*

"Peach trees never require a rich soil; the poorer the soil, the better the fruit—a middling soil produces a more bountiful crop.

"The highest ground, and the *north* side of hills is best for peach trees; they keep back vegetation, by which means the fruit is often preserved from being killed by late frosts in the month of April, in the Pennsylvania latitude. I have made these observations from actual experience.

"A gentleman from Monongahela county, in Virginia, called at my house, and asked me who instructed me to cultivate peach trees: I told him that observation and experience were my teachers. The gentleman observed, that colonel Luther Martin, in the lower parts of Maryland, and another gentleman, near the same place, whose name he could not recollect, were pursuing the same plan advantageously."

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* "This assertion is directly contrary to the experience of a gentleman in New Jersey, who has remarkably fine peaches, regularly manures his trees every year, and asserts that the speedy decay of common peach trees is owing chiefly to a neglect of the practice. He even said experience convinced him it was owing to the same circumstance, that peach stones did not, in general, produce fruit like the original tree.

"The practice of Mr. Coulter, in cutting down the trees, is highly rational: they are thus forced to spend their vigour upon their bodies and roots, instead of shooting up into the air with thin barks, which are easily penetrated by the fly.

"The best kind of peaches is said to be produced from inoculation; and upon an *apricot stock*, as they are not liable to be injured by the fly; and that peach trees thus produced, grow larger and rise higher than when on the peach stock. Grafting the peach upon a plum stock has also been practised, with a view of resisting the attack of the fly; but this operation must be performed under ground, otherwise an unsightly knob will be the consequence of the peach tree overgrowing the plum stock, and endanger the breaking off of the tree at the place of junction.

"The directions given by Forsyth, with respect to wall peach trees, may be applied to our standard trees, viz. to pinch off all the strong shoots in June, the first year the tree bears; which will make them throw out side shoots: these, if not laid too thick, will make fine bearing wood for the succeeding year. If the strong shoots be suffered to grow to their full length, they will be large and spongy, and will neither produce good fruit nor good wood for the following year. Sometimes weakly trees are covered with blossoms; but if too much fruit be suffered to remain on them, they will be weakened so much that they will never recover. In that case, I would recommend picking off the greater part of the fruit, to let the tree recover its strength. When trees in this state are pruned, never prune at a *single flower-bud;* as the shoot will be either entirely killed, or, at least, die as far as the next wood-bud.

"I have often topped the strong shoots twice in the course of the summer, before they produced the fine kind-bearing wood. These strong shoots exhaust the tree, and never produce good wood, when neglected to be topped. I would recommend to cut out such shoots when the trees are pruned in the spring, and to leave only the bearing wood, which may be known by two small leaves, where the flower-buds will be in the following year; (the strong shoots having only one leaf bud at each eye;) and to pick off all side shoots near the tops of the branches, as soon as they can laid hold of."

In addition to the foregoing details, I must not omit to recommend in strong terms other means of preserving the health and vigour of this very valuable tree, the fruit of which, when in perfection, is perhaps equal, if not superiour to that most luscious of the tropical fruits, the *ananas.* Since it is ascertained that the fly deposits its eggs, which produce the fatal worm, in the bark, it is obvious that if the stem of the tree could be enveloped with some harmless substance, it might baffle the instinctive faculties of the fly, or from its hardness, resist its powers of attack. For this purpose, let the earth around the roots and stem be removed, and its place supplied with some one of the articles mentioned in page 105; after which, let the whole trunk of the tree and large branches, from the surface of the earth to the top, receive a good coating of the composition of quicklime, cow-dung and clay, page 105. This would not be a very expensive expedient even for an extensive orchard, and the preservation of the trees would be an ample reward; but for a few favourite trees in the garden no person need hesitate to try the experiment, even upon young trees, at the time of transplanting. Should it fail as a preventive remedy against the fly and worm, (which is scarcely possible) the application will have a tendency to increase the growth and vigour of the tree. If in any of the uncovered branches black spots or oozing of gum should be discovered, let the branches be immediately cut away, and the wound covered with the same composition, and young shoots will soon sprout forth and bear fruit. When peach trees have become unproductive from old age or disease, Mr. Forsyth, from long experience, recommends to head them down according to rule, and apply the composition, by means of which, trees in the worst condition may be completely renovated, and rendered abundantly fruitful. Hitherto, the diseases of peach trees among us have eluded all our art and skill: how far a different management may prove successful, time and experience must determine. It may, however, well be questioned whether it is most profitable to renew our stock by frequently planting the seed, or to attempt to protract the existence of old unproductive trees by the application of remedies. For myself, I have closely investigated the subject of canine madnesss in the human species, and the desperate maladies among the peach trees, and am compelled to denounce them both as equally intricate and irremediable, and as equally meriting the appellation of opprobium medicorium.

"A good peach possesses these qualities: the flesh is firm; the skin is thin, of a deep or bright red colour next the sun, and of a yellowish green in the shade; the pulp is of a yellowish colour, full of highly flavoured juice; the fleshy part thick, and the stone small. They are generally divided into *free stone* and *cling stone peaches.* Those varieties, the flesh of which separates readily both from the skin and the stone, are the *proper* peaches of the French, and are by English gardeners termed *free stones.* Those with a firm flesh, to which both the skin and the stone adhere, are the *pavies* of the French, and by English and American gardeners named *cling stones.*

LIST OF CHOICE PEACHES,

FROM MC MAHON'S AMERICAN GARDENER.

ALL the varieties, he observes, may be cultivated to advantage in every state of the union, if soil and exposure be given agreeable to their nature and necessities. 1. The Early Avant; 2. The White Nutmeg; 3. The Red Nutmeg; 4. Early Mignonne; 5. Early Ann; 6. Early Newington; 7. Early Elizabeth-Town; 8. The White Magdalen; 9. Red Clingstone; 10. White Clingstone; 11. Kennedy's Caroline; 12. Royal George; 13. Oldmixon; 14. Late Heath; 15. La Plata; 16. Georgia; 17. The Congress; 18. Bourdine; 19. President; 20. English Incomparable; 21. Chancellor Rambouillet; 22. La Titon de Venus; 23. La Pourprie; 24. Belle Chevreuse; 25. Noblesse; 26. Bellegarde; 27. Large Yellow Freestone; 28. White Pavie; 29. Monstrous Pavie; 30. Clifton's Nutmeg; 31. Lemon Peach; 32. Large Newington; 33. Carolina Clingstone.

1. *Admirable peach.*—A very large and comely fruit, of an agreeable mixture of colours. Its pulp, though rather firm, has a delicate taste, contains a sweet, vinous juice, of a fine flavour, and is pale red near the stone. It becomes eatable about the middle of September.

2. *Alberge,* or *orange peach*—Is one of the most elegant and best flavoured of the clingstones; rather large than otherwise; round; dark red or purple next the sun, and bright orange on the other side; being deeply furrowed from the stem to the blossom end: the flesh of a deep orange colour, but purple at the stone; ripens in August. The tree is a very great bearer.

3. *Aune peach,* or *early Ann*—Is a small, round fruit, of a yellowish white colour, faintly tinged with

red on the sunny side; ripening about the middle of August.

4. *Bellegarde*, or *Galande.*—This is a beautiful, large and excellent peach, with a strong tint of red on a yellow ground, and of a deep red shade on the south side. Its pulp, though rather firm, yields a sweet juice, of an agreeable taste. Ripens in September.

5. *Blood Peach*—Makes a beautiful preserve, and is cultivated chiefly for that purpose. The tree is hardy, and a great bearer.

6. *Boudine*—Is a large, round fruit, of a fine red next the sun; the flesh white, melting; juice vinous and rich; ripens in September. The tree a plentiful bearer.

7. *Catharine.*—A large, round fruit, of a dark red next the sun; the flesh white, melting; full of a rich juice; a clingstone: ripens in October.

8. *Charlestown*, or *ananas peach*—Is a new sort, reared in America from the kernel. Although its colour is inferiour to that of most other peaches; being a uniformly pale yellow, without any red tint, yet its firm and juicy pulp possesses the delicious flavour of the pine apple. It ripens in October.

9. *Early Newington*—Is a fruit of middling size, of a fine red next the sun; flesh firm, with a sugary, well flavoured juice. There are several varieties of this fruit, all clingstones; ripening in August and September.

10. *Heath peach.*—Of all peaches, perhaps of all fruits, it is said, there is none equal in flavour to the American *Heath peach*, a clingstone. It is large, weighing near a pound, in common; with but moderate attention, it is believed, they would very generally weigh a full pound. It is backward in ripening, northward of the Susquehannah, and is generally one of the last sort that ripens. "This very fine clingstone peach is generally esteemed the

finest in our country: the original stone was brought, by the late Mr. Daniel Heath, from the Mediterranean; it has ever since been propagated from the stone, in Maryland, where I have seen it in great abundance and high perfection, as a natural fruit, in September and October. It is usually propagated in this and the adjoining states by inoculation: I have for some years raised them from the stone, and have now a number of vigorous trees from stones, brought from Maryland. It is a very large fruit, of a form rather oblong, and uniformly terminating in a point at the head; the flesh is singularly rich, tender, melting and juicy; the stone frequently opens, disclosing the kernel: the skin is a rich, cream-coloured white, sometimes with a faint blush, but the finest peaches are entirely white; the juice is so abundant, as to make it difficult to eat this peach without injury to the clothes; the leaf is luxuriant, and smooth at the edge; the tree vigorous, hardy and long-lived, compared with other trees: the fruit ripens in September, lasts through the month of October, and is frequently eaten in high perfection in November. It is of all peaches, when not too ripe, the most admired, when preserved in sugar or in brandy." (Coxe's Cultivation of Fruit Trees.)

11. *Large mignonne*—Is somewhat oblong in shape, and generally swells out on one side. The juice is very sugary, and of high flavour. This is one of the most handsome and delicious fruits, of a dark red and greenish yellow cast; having a white, melting and agreeable pulp, containing a sweetish vinous juice, and is in eating about the middle of September.

12. *Lemon clingstone*—Is a large, late, but beautiful and high flavoured peach. It ripens the last of September and beginning of October.

13. *Monstrous pavie.*—This is the largest of the peaches, and a true ornament to the dessert, as it

displays a beautiful red tint on a white ground. Its pulp is white, though red in the parts next the stone, and contains a vinous, sweet juice. Ripens in September.

14. *Noblesse*—Is a large fruit, red or marbled next the sun; flesh greenish white, and melting; juice very rich in a favourable season.

15. *Old Newington*—Is a large round fruit, of a beautiful red next the sun; the flesh white and melting; when ripe, the juice very rich and vinous: a clingstone, and matured early in October.

16. *Rambouillet*—Is a fruit of middling size, deeply divided by a furrow; the flesh melting, of a bright yellow colour; juice rich, and of a vinous flavour: ripens about the middle of September. The tree is a good bearer.

17. *Red rareripe*—"Is a peach of uncommon excellence, frequently called Morris's rareripe. It is of unusually large size, sometimes weighing eight and nine ounces; of a round form, beautiful red and white skin; rich, tender and melting flesh, full of sugary, highly flavoured juice; equal to any peach cultivated at the same season. Ripens in the early and middle parts of August. Clear at the stone." (Coxe.)

18. *Red magdalen.*—It is large, round, and of a fine red next the sun; the juice very sugary, and of exquisite flavour: ripening in the end of August. The tree is a free grower, and a great bearer.

19. *Red nutmeg*—Is a great bearer, and valued for its early maturity. It is of a bright vermilion colour, and has a fine musk taste. Ripens in August.

20. *Royal George*—Is an excellent peach, and in a very good soil and aspect the fruit becomes large; dark red next the sun, juicy and high-flavoured.

21. *Swalch.* This is a fine, pleasant-flavoured peach. Ripens early in September.

22. *Teton de Venus*—Is a fruit of middling size and longish shape; of a pale red next the sun; flesh melting, white; juice sugary, and not without flavour: ripens the end of September. The tree is a free bearer on a warm, light soil, but the fruit comes to perfection only in fine seasons.

23. *Vanguard*—Is a good peach, ripens about the middle of September.

24. *White Magdalen.*—The fruit is of a middle size, round, with a deep furrow; of a pale colour, and the flesh white to the stone; melting, juicy, with considerable flavour. Ripening in August.

25. *White Rareripe*, or "*White cheek Malacotan peach*—Sometimes called the freestone heath: is a fruit of uncommon excellence. The size is large; the flesh a rich white, inclining to yellow, melting, rich, and finely-flavoured; firm, like the flesh of a clearstone plum: the skin is a pale yellowish white: the stone frequently separates on the opening of the peach, leaving the kernel exposed; the shells adhering to the flesh, though a freestone. It is the most admired fruit of the season, which is in August." (Coxe.)

The following fact has come to my knowledge since writing the foregoing.

"The cultivation of this tree has become very interesting to gardeners in the vicinity of this city, (New York.) A very simple mode of preserving and restoring them when apparently nearly destroyed by the disease so fatal to them in this quarter, and commonly called the "yellows," has been accidentally discovered by a gentleman in this city. A statement of the fact as it occurred will convey all necessary information. In the fall of 1818, a very fine tree standing in his yard, was apparently dead from the effects of the abovementioned disease. Throughout the fall and winter very large quantities of common wood ashes were casually thrown by the servants about the roots of the tree. To the astonishment of all who had seen it the preceding fall, it put forth its leaves vigorously the next season, and bore abundance of fine fruit. A small quantity of wood ashes was again thrown round its roots last fall, and the tree has now become so full of fine fruit that it has become necessary to prop it up. This is a very simple remedy, and certainly worthy of trial. The foregoing paragraph is from Mr. Lang's gazette of this morning. A gentleman has since called upon us who has tried the same experiment with all the success he could have desired. He wishes us to recommend this simple method of preserving this valuable fruit tree to the publick, and he also suggests to the New York Agricultural Society the expediency of having printed handbills of the above article stuck up in all the markets, and given to every countryman who attends them, that the information may be as widely diffused as possible." (New York Com. Advertiser.)

It may be further observed, that cherry trees and plum trees will be equally benefitted by the same application, and the practice ought to be generally adopted. Tanner's bark put round peach and other fruit trees has been found by experience exceedingly useful. Ringing the branches of peach trees has proved beneficial. See page 29.

CHERRIES.

THERE are several native varieties of the cherry in the United States, which have been perpetuated from the seed, unaided by the hand of culture, and, as supposed, without any deviation from the original stock. But the cultivated kinds are far more valuable, and it is greatly to be regretted, that they are so generally neglected. Many advantages would accrue to the farmer from the cultivation of the cherry tree; it would serve the useful purposes of ornament and shade to his orchard and buildings, and the fruit would afford his family not merely an innocent, but a salutary luxury; and if near a market, the profit would remunerate him for all his labour and expense.

The cultivated cherry, when reared from the seed, is much disposed to deviate from the variety of the original fruit, and, of course, they are propagated by budding or grafting on cherry stocks: budding is most generally preferred, as the tree is less apt to suffer from oozing of the gum than when grafted. The stocks are obtained by planting the seeds in a nursery, and the seedlings are afterwards transplanted. Those kinds which are called heart cherries are said to succeed best on the black mazard stock; but for the round kind, the Morello stocks are preferred, on account of their being the least subject to worms, or to cracks in the bark, from frost and heat of the sun. The whole method of management pertaining to cherry trees is so precisely similar to that already detailed, when treating of peach trees, that very little remains to be said on the present occasion. But the following directions given by Forsyth, in his treatise on fruit trees, will probably be acceptable.

"In the choosing and planting of young cherry trees, the same rules are to be observed that are given for apricots, peaches and nectarines; and they must in like manner be headed down the first year.

"In pruning cherries never shorten their shoots; for most of them produce their fruit at the extremities, the shortening or cutting off of which very frequently occasions the death of the shoot, at least of a great part of it. The branches, therefore, should be trained at full length. I have often seen the whole tree killed by injudicious pruning. Wherever the knife is applied, it is sure to bring on the gum, and afterwards the canker, which will inevitably kill the trees, if no remedy be applied to the wounds. I have headed down a great many cherry trees, which were almost past bearing, and so eaten up by the gum and canker, that the few cherries they bore were very bad.

"In the years 1790 and 1791, I headed down fifty trees. The operation should be performed in the month of April in each year. These trees made shoots from three to five feet, the same summer, bore fine cherries the next year, and have continued to bear good crops ever since.

"To the above trees I applied the composition. At the same time I cut down twelve trees in the same row, but did not apply the composition: these twelve trees all died in the second and third years after. One tree where the composition was applied, now produces more fruit than the whole number formerly, also much finer and larger.

"When cherry trees are very old and much injured by large limbs having been cut or blown off (which will bring on the canker and gum) the best way to bring them to have fine heads, and to fill the vacant space, is to head them down as low as possible, taking care to leave some small shoots, if there be any; if not, a bud or two at the end of some of the shoots. Sometimes it is difficult to find any buds. In that case, before you mean to head the trees, make some incisions in the branches. This should be done on different branches, at the most convenient places for filling the tree with good wood. The size of the incisions should be from one to two inches, according to the size of the branches, observing to make them just above the joint, where the buds should come out.

"The time for performing this operation, is March, April, or May. (In America, March.) The above method is only recommended where there are no young shoots or buds, and when the tree is in the last stage of the canker.

"Where you find a few young shoots or buds, cut down the head as near to them as you can, and take care to cut out all the canker till you come to the sound bark. If any gum remains, it must be cut or scraped off: the best time for this is when it is moistened with rain; it may then be scraped off without bruising the bark. This operation is very necessary.

"Wherever the bark or branches have been cut off, the edges should be rounded, and the composition applied. If the young shoots are properly trained, they will produce fruit the following year; and in the second year they will produce more and finer fruit than a young tree which has been planted ten years.

"Never make use of the knife in summer, if it be possible to avoid it, as the shoots die from the place where they are cut, leaving ugly dead stubs, which will infallibly bring on the canker. These shoots may be cut in the spring to about two eyes, which will form a number of flower-buds.

"When cherry trees begin to produce spurs, cut out every other shoot, to make the tree throw out fresh wood: when that comes into a bearing state, which will be in the following year, cut out the old branches that remain; by that method you will be able to keep the trees in a constant state of bearing, taking the same method as before directed with the fore right shoots.

"Great care should be taken to rub off many of them in the month of May, (middle of June in America,) leaving only such a number as you think will fill the tree. By so doing your trees will continue in a fine healthy state, and not be in the least weakened by bearing a plentiful crop of fruit. The reason is obvious; the great exhalation which would be occasioned by the sun and air in the common mode of pruning, is prevented by the composition keeping in the sap which nourishes the branches and fruit. I cut some trees, as directed above, more than twelve years ago, that are now in as good a state of bearing as they were in the third year after the operation, and likely to continue so for many years.

"In 1797 I cut some very old trees in the month of May, which were left, to show the old method of pruning; I at the same time cut some branches off the same trees, according to the new method, to show the difference of the fruit, which was taken by all who saw it for a different sort of cherry. The cherries from the old spurs were not half the size of the others, and were at least three weeks later.

"Several persons have adopted the new method with great success, and by renovating their old trees, which scarcely bore any fruit, have obtained from them an abundant quantity. But even the increased *quantity* of the fruit is not so material, in cherries, as the increase in the *size* and in the *rich-*

ness of the flavour. In this respect the method of pruning here laid down is invaluable. When old standard cherry trees become decayed and hollow, I would recommend heading them down, as directed for wall trees and dwarfs. Scoop out all the rotten, loose, and decayed parts of the trunk, till you come to the solid wood, leaving the surface smooth; then use the composition as directed for fruit trees."

"The following twenty are the principal cherries cultivated in the United States, the account of which was furnished by Mr. William Prince, of Long Island. (Dom. Ency.)

"*May Duke*—Ripe in May and June: long stem, round and red, an excellent cherry, and bears well.

"*Black heart*—Ripe in June: a fine cherry.

"*White heart*, or *sugar cherry*—Ripe in June: white and red.

"*Bleeding heart*—Ripein June, a very large cherry, of a long form, and dark colour; it has a pleasant taste.

"*Ox heart*—Ripe in June: a large, firm, fine cherry.

"*Spanish heart*—Ripe in June.

"*Carnation*—Ripe in July: it takes its name from its colour, being red and white; a large round cherry, but not very sweet.

"*Amber*—Ripe in July.

"*Red heart*—Do.

"*Late Duke*—Do.

"*Cluster*—Planted more for ornament or curiosity than any other purpose.

"*Double blossom*—Ripe in July.

"*Honey cherry*—Do. small sweet cherry.

"*Kentish cherry*—Ripe in July.

"*Mazarine*—Do.

"*Morello*—Ripe in July and August: a red, acid cherry, the best for preserving, and for making cherry brandy.

"*Early Richmond cherry.*—This fruit originated near Richmond, in Virginia, and is the earliest cherry in America, and valuable on that account: it is the size of a May duke, and resembles it in form.

"*Red bigereau*—A very fine cherry, ripe in July: of a heart shape.

"*White bigereau*—Ripe in July and August: remarkably firm: heart shape.

"*Large double flowering cherry.*—This tree produces no fruit, but makes a handsome appearance in the spring, when it is covered with clusters of double flowers as large as the cinnamon rose; it differs from the common double flowering cherry, which never forms a large tree, and has small pointed leaves.

"The three last were imported from Bourdeaux, in 1798.

"*Small Morello cherry*—Called also Salem cherry, because it came originally from Salem county, New Jersey, is cultivated by Mr. Cooper of that state, who values it highly. The fruit has a lively acid taste. The tree produces abundantly, and is the least subject to worms of any cherry tree.

"Mr. C. says that the Bleeding Heart suits a sandy soil, but that the May Duke will not flourish in it."

Besides the foregoing list, the *black mazard*, or natural cherry, with its several varieties, should be mentioned as excellent fruits, and valuable for being later than the others. They make very useful and hardy stocks for propagating other varieties. This fruit ripens in June or July, and is used by way of bounce in rum or brandy. Another native fruit is the common red cherry which abounds in New England. The fruit is not of a superiour quality, being very acid, unless perfectly ripe: it might perhaps be improved by grafting and proper cultivation.

The *wild*, or *native black cherry*, of spontaneous growth, is deserving of some attention. The fruit, when infused in rum or brandy, imparts its astringent and cordial qualities, and forms a pleasant and salutary liquor. The bark of the root of the tree is very astringent, and makes a useful stomachick bitter; and the wood is frequently employed by artists as a tolerable substitute for mahogany, being susceptible of a handsome polish.

Cherry brandy is made in the following manner: Fill the cask with cherries; pour over them as much brandy as the cask will contain. When it has been on ten days, draw it off, and pour on hot water: let this remain sometime, shaking the cask frequently; then draw it off, and mix the last with the first liquor.

INDEX.

A

- Apples, physical properties of . . . 12
  - particular varieties become extinct by age 18, 27
  - new varieties, production of 18, 19, 20, 24, 27
  - improved by grafting early and late on the same tree . . . 36
  - should be gathered by hand . . 114
  - how to ascertain when ripe . 114
  - best method of preserving . 113, 115
  - juice of, when most dense, makes the best cider 141
  - which yield the best juice for cider . 142
  - sweet entitled to preference . 13
    - useful for a sick horse . . 13
      - fattening cattle . 13
      - making molasses . 13
  - different sorts of, in United States . . 118
  - American Pippin . . . 120
  - American Nonpareil . . 120
  - Aunt's Apple . . . 120
  - Autumn or Fall Pippin . . . 120
  - Baldwin or Pecker Apple . . 121
  - Baltimore Apple . . 121
  - Black Apple . . . 121
  - Bell Flower . . . 121
  - Bow Apple . . . 121
  - Brownite . . . 121
  - Bullock's Pippin . . . 122
  - Campfield . . . 122
  - Cathead 122
  - Catline . . . 122
  - Carthouse 122
  - Cider Apple . . . 123
  - Codling 123
  - Corlies' Sweet . . . 123
  - Cooper's Russeting . . . 124
  - Flat Sweeting . . . 124
  - Gloucester White . . . 124
  - Golden Pippin . . . 125
  - Golden Rennet . . . 125
  - Green Everlasting . . 125
  - Green Newton Pippin . . 125
  - Greyhouse . . . 126
  - Hagloe Crab 126
  - Harrison Apple . . . 127
  - Harty Sweeting . . . 128
  - High Top Sweeting . . 128

Apples, Holmes Apple 128
Holten Sweeting 128
Hughes's Virginia Crab 129
Lady Apple 129
Lady Finger 129
Large Red and Green Sweeting 129
Large Early Harvest 129
Loring Sweeting 129
Large Yellow Newark Pippin 130
Maiden's Blush 130
Michael Henry 130
Monstrous Pippin 131
Morgan Apple 131
Newark King Apple 131
Nonsuch 131
Nursery Apple 131
Pearmain 131
Pennock's Red Winter 132
Poveshon 132
Pound Apple 132
Priestly 132
Queen Apple 133
Quince Apple 132
Rariton Sweeting 133
Red Everlasting 133
Redling 133
Red Streak 133
Rambo 134
Roan's White Crab 134
Rhode Island Greening 134
Roman Stem 135
Royal Pearmain 135
Royal Russet 135
Roxbury Russeting 136
Ruckman's Pearmain 136
Seek no further 136
Spitszenburgh 137
Spice Apple 137
Styre 137
Summer Pearmain 138
Swaar Apple 138
Sweet Greening 138
Tolman Sweeting 139
Vandevere 139
Vanwinkle 139
Wine Apple 140
Wine Sap 140
Yellow Sweeting 140
Apple Trees, soil and climate of the United States adapted to 9
original stock of 15
native crab 15
do not enjoy indefinite longevity 18
cultivated or seedling stocks 16
reared from seed seldom produce the same kind of fruit 16, 18, 24
best adapted soil for 17

Apple Trees, in certain places some kinds succeed better than others . . 17
may be forced to bear fruit . . 28
instance of one bearing fruit of opposite qualities . . . 22
those which produce good fruit should not be suffered to grow near those which produce bad fruit . 21
will not flourish where old ones have died 54
should not be planted deep in the soil 52
heading down old ones, utility of 69
of spontaneous growth, produce tolerable crops . . 59
injured by bearing too abundantly . 58
cultivated successfully in unfavourable situations . . . 60
when young, should be headed down 45
annual wash for . . 73
disbarked . . 80
hide-bound, how treated . . 75
means of preserving the health and vigour of . . 73
washing of, with soft soap . 74
clay-paint recommended for . 74
diseases of, &c. which render them unproductive . . 76

B

Bark of Apple Trees, torn off by field mice, remedied 81
cracks when hide bound . 75
scaly, should be scraped off 80
injured by exposure to the sun 75
Blight 76
Blossoms, of different trees intermix and change the quality of the fruit . . 21
injured by spring frosts . . 82
black flies . . 83
Borer, (*see worm.*)
Brandy, made from apples . . . 177
peaches by distillation . 194
Brush for destroying caterpillar's nests . . 97
Buds, description of 40
Budding, observations on . . . 40
proper season for . . 40
different modes of . . . 41, 43
of peach trees preferable to grafting . 199
composition to be used in . . 43

C

Canker 78
remedies for . . . 79
Canker Worm, character and description of . 84
history of, by Professor Peck . 84
various remedies for . . 85, 95
directions for tarring . . 86
proposed remedy by Professor Peck . 84
Mr. Kenrick . 89
observations on, by J. Lowell, Esq. 91

- Cherry Worm, lime the most eligible remedy 94
    - flax rubbish and sea weed proposed 94
    - Dr. Dean recommends to destroy them through the agency of swine 94
- Caterpillars 95
    - disgraceful to farmers 95
    - description of 96
    - methods of destroying 96—100
    - brush for destroying 97
- Cherries, 211
    - method of propagating 212
        - treatment by Forsyth 212
    - list of 215
    - May Duke 215
    - Black Heart 215
    - White Heart 215
    - Bleeding Heart 216
    - Ox Heart 216
    - Spanish Heart 216
    - Carnation 216
    - Amber 216
    - Red Heart 216
    - Late Duke 216
    - Cluster 216
    - Double Blossom 216
    - Honey Cherry 216
    - Kentish Cherry 216
    - Mazarine 216
    - Morello 216
    - Early Richmond Cherry 216
    - Red Bigereau 216
    - White Bigereau 216
    - Large Double Flowering Cherry 216
    - Small Morello Cherry 216
    - Black Mazard 217
    - Wild or Native Black Cherry 217
- Cherry Brandy 217
- Cider 141
    - apples which yield the best juice for 142
    - making and managing 141
    - proper casks for, and how kept sweet and clean 144, 153
    - fining with isinglass 148, 151
    - method of making and fining by Jos. Cooper, Esq. 155
    - observations on, by J Lowell, Esq. 158
    - concise rules for making and managing 148
    - stumming of casks for 171
    - bottling 148
    - medicinal properties of 177
- Cider Wine 177
- Clover, said to be injurious to orchards 55
- Compositions to be applied to wounds in pruning, in grafting, in budding, in canker, and in heading down 64, 69
- Curculio, account of by Dr. Tilton 109

D

- Decortication, or disbarking fruit trees 80
- Directions for making and applying Forsyth's composition 69

E

- Engrafting, the art not traced to its origin . 32
  - introduced into America by Mr. Prince 33
  - proper season for . . 35
  - stocks for grafting should be of the same genus and natural family with the scion 33
  - choice of scions for grafting . 33
  - when scions should be taken & how preserved 34
  - scions should not be taken from seedling trees 34
  - winter fruit should not be grafted on a summer stock . . . 33
  - modes of grafting . . 36
  - whip-grafting . . . 37
  - tongue-grafting . . 37
  - cleft-grafting . . . 37
  - crown-grafting . . 38
  - side-grafting . . . 38
  - root-grafting . . . 38
  - new mode of grafting . . 39
  - extreme branch grafting . 39
  - clay used in grafting . . 36
- Engrafted fruits not permanent . . 23

F

- Flax shaws useful when applied round fruit trees . 58
- Fruit, directions for picking and preserving . 113, 115

I

- Inoculation, (*see budding.*)

L

- Lice infesting young orchards in Maine . 107

M

- Manuring fruit trees, utility of . . 56
  - instance of resuscitating an old apple tree by 56
  - best kinds of manure . . 56
  - must not be carried to excess . . 57
- Means of preventing flowers and fruit falling off, and of retarding their opening . . . 75
- Moss and scaly bark on trees . . 80

N

- Nursery 30
  - soil and situation for . 30
  - method of planting apple seeds in . 31
- Nursery pruning 44
- Observations on Forsyth's treatise, by Mr. Yates . 72
  - Mr. Cobbett 71

O

- Orchard, planting and culture 46
  - most eligible soil and situation for . 46
  - northern exposure preferable for . 47
  - preparation of the land and planting . 50

Orchard, proper season for planting . . 50
may be established in unpromising situations 60
proper distance for planting trees in . 49
ground should be cultivated . . 55
trees, should be planted in straight rows 48
inclining towards the east . 48
directions for planting, by Marshall 52
Orchard Pruning . . . 61
former errours in . . 62
proper season for, when the sap is in active circulation . 64
regard must be had to soil and climate 65
observations on, by Mr. Marshall 67
Mr. Yates 62
composition should be applied 65
never suffer a sucker to grow 66
Orchard and Cider establishment of Wm. Coxe, esquire 118

P

Peaches 194
method of propagating . . 195
may be budded or grafted on other stocks 196, 203
qualities of . . . 205
excellent brandy made from . . 194
divided into freestones and clingstones 205
lists of 206
Admirable Peach . . 206
Alberge 206
Anne or Early Ann . . 206
Bellegarde . . . 207
Blood Peach . . . 207
Bowdine 207
Catharine . . . 207
Charlestown . . . 207
Early Newington . . 207
Heath 207
Large Mignonne . . 208
Lemon Clingstone . . . 208
Monstrous Pavie . . 208
Noblesse . . . 209
Old Newington . . 209
Rambouillet . . . 209
Red Rareripe . . . 209
Red Magdalen . . . 209
Red Nutmeg . . . 209
Royal George . . . 209
Swalch 209
Teton de Venus . . . 210
Vanguard . . . 210
White Magdalen . . . 210
White Rareripe . . 210
Peach Trees, liable to premature decay . 195
cannot be reared a second time in the same place . . 195
method of treating, by Forsyth 196, 203
causes of the decay of . . 197
fly and worm which attack them 198

Peach Trees, method of preventing injury from the fly and worm . 198, 204
    directions for cultivating . . 200
    diseases of, elude our art and skill 205
    ringing of . . . 29
Pears, ... 180
    list of 186
    Brockholst Bergamot . . . 186
    Brown Beurre . . . 186
    Catharine Pear . . . 186
    Chaumontelle . . . 186
    Colmart . . . 186
    Crassane 186
    Easter Bergamot . . . 186
    Garden Pear . . . 187
    German Muscadell . . 187
    Green Summer Sugar Pear . . 187
    Grey Butter Pear . . 187
    White Butter Pear . . . 187
    Jargonelle . . . 187
    Little Muscat . . . 187
    Mons Jean . . . 188
    Orange Pear . . . 188
    Pound Pear . . . 188
    Nonpareil Bergamot . . . 188
    Prince's Pear . . . 188
    Radish Pear . . . 189
    Rousseline . . . 189
    Sarasin 189
    Seckle Pear . . . 189
    Skinless Pear . . . 191
    Squash Pear . . . 191
    Saint Germain . . . 191
    Saint Michaels . . . 192
    Summer Good Christian . . 192
    Virgouleuse . . . 192
    Winter Baking Pear . . 193
        Good Christian . . 193
        Thorn . . . 193
Pear Trees are well adapted to the soil and climate of New England . . 180
    may be grafted on a quince stock 33, 130
    propagation of particular varieties of, by grafting or budding 180
    attention necessary in the choice of stocks 180
    never employ suckers for stocks 180
    never graft a winter pear on a summer stock 180
    much benefited by washing with soft soap 181
    require but little pruning . . 181
    when defective, should be headed down 182
    method of treating decayed pear trees, by Forsyth . . 182
    method of reclaiming unproductive pear trees, by Mr. Knight . 184
    extraordinary produce after heading down 182
Perry 185
Pomona Wine 177

Q

Quince 193

S

Sap, theory of the circulation of . . 29
Seaweed, applied to fruit trees useful . 58
Seedling Trees, how to be treated . . 31
Scions, when to be taken from the tree . 34
  how preserved . . . 34
  importance of a proper choice of . 34
Slug Worm, description of . . . 106
  remedy for . . 107
Suckers should never be suffered to grow . 66
  improper for stocks to graft on . 36

T

Tanners' Bark, utility of . . . 211

W

Wine, made from cider . . 179
  Pomona 177
Worm called the Borer . . 100
  method of destroying . . 101
  report of the committee in favour of Mr. Hearsey's method . 102
  method proposed to prevent its attack 104

3 2044 103 115